

ALLOCATING RIVER USE\*

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## FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

FINDING: Allocation is a new problem in river management, but it has long been an issue in other areas. The most common criteria for "distributive justice" are equality, equity, need, and/or social efficiency. Assessing value is a major problem in allocating, particularly with non-market commodities (pp. 2-5).

FINDING: Resource scarcity generally creates a situation which fosters conflict among groups, as it has between private and commercial river runners (pp. 5-7).

FINDING: River running requires equipment, skills, and access to the river. Commerical passengers go on trips where outfitters provide all three; groups of private users possess the necessary equipment and skills, but access must be obtained from the managing agency. Allocations have generally been based on either 50-50 split or historical use (pp. 7-9).

FINDING: Arguments have developed about the amount of use each group ought to have. It helps to distinguish three segments of the "user public:" outfitters, commerical passengers, and private users. Managers arbitrate allocations to these groups (pp. 9-11).

FINDING: Managers, outfitters, and private users have a few allocation goals in common. Differences, which are more numerous, reflect different positions in the allocation process and a desire to protect access privileges (pp. 12-16).

CONCLUSION: Split allocations were first developed as the most reasonable approximation of the way things had been done in the past. It now appears that such systems have bad unintended consequences, and they should be evaluated in terms of allocation criteria such as equality, equity, social efficiency, and need (pp. 16-20).

FINDING: Space on rivers has become a scarce resource. It appears that a market mechanism is free to operate in the commercial sector, and access permits have acquired considerable monetary value. In the private sector, a market mechanism is less free to operate, and agencies have involved a variety of non-market allocation mechanism (pp. 20-24).

CONCLUSION: Current allocation systems take public resource access rights and give them at little or no cost to outfitters and private trip leaders, who are then in a position to re-allocate (and perhaps sell) those rights back to the public (p. 24).

FINDING: Alternative allocation mechanisms include pricing, queuing, merit, reservation, and lottery. Each has advantages and disadvantages. Reservation systems have been used extensively for public campgrounds, and lotteries have been developed for hunting permits. Experience in these areas provides helpful ideas for river management (pp. 24-31, Appendices 2 and 3).

FINDING: Less restrictive mechanisms can be used to distribute use more evenly, sometimes increasing the supply of space on the river. Such mechanisms still require use limits, and allocation will still be necessary if demand continues to increase (pp. 31-32).

FINDING: Float use in Hells Canyon has increased an average of 22% per year in the past 5 years, which means that use is doubling approximately every 3-4 years. Increases in commercial use averaged 18% per year, while increases in private use averaged 36%. Both sectors had unused launches in 1978 (pp. 32-36).

CONCLUSION: Changes in allocation mechanisms will probably affect outfitting businesses, although there is little evidence for predicting what the changes may be. It is important to document the present situation of outfitters in Hells Canyon, in terms of financial status and the range of services offered (pp. 37-46).

RECOMMENDATION: Financial data on outfitters should be gathered immediately (format provided in Appendix 4).

FINDING: Licensing of guides by managing agencies has generally involved both certification of competence and allocation of access (p. 46).

CONCLUSION: Certification probably does not require allocation (p. 46).

CONCLUSION: Allocation decisions are usually made by choosing an allocation mechanism and then hammering it into a shape which approximately fits an area's specific needs.

RECOMMENDATION: A more productive approach is to decide the allocation goals for a specific area and then choose a mechanism or combination of mechanisms which will best accomplish those goals. Dissenters can then suggest better ways to accomplish specified goals or propose different goals; in either case discussions are more likely to be focused and productive (pp. 47-54).

RECOMMENDATION: Systems should be monitored to see how well they are accomplishing allocation goals. Uniform data should be collected so changes can be followed over time and different areas can be compared (pp. 54-58).

FINDING: Managers specified a list of allocation goals for Hells Canyon. (pp. 58-59).

CONCLUSION: A more flexible and efficient reservation system will probably solve most of the present allocation problems in Hells Canyon (p. 60).

RECOMMENDATION: The most novel aspect of the recommended system is that individual users would obtain permits directly from the agency. This should create more equal permit procedures, with some differences designed to better meet user needs. Information given to users would allow them to weigh the probability of getting a permit against their own preferences for launch dates (pp. 60-63).

RECOMMENDATION: Several other factors need to be incorporated into a new system. Lead times should be based on user planning horizons, maximum

trip size needs to be reconsidered, and a system needs to be developed for re-allocating launches among outfitters if demand changes. (pp. 63-64).



## I. INTRODUCTION

Not long ago, there were very few people running whitewater, and the opportunity to float a river was essentially an infinite resource which was available to anyone. But use has increased dramatically on popular whitewater rivers. During the period from 1967 to 1972, the number of floaters per season grew from 2,000 to 16,000 in Grand Canyon, from 2,500 to 17,000 in Dinosaur National Monument, and from 1,300 to 4,000 on the Middle Fork of the Salmon River (Interagency Whitewater Committee, 1976). Whether demand will continue to increase is a matter of speculation, but a variety of factors suggest that it will (see, for example, Parent 1978a).

Increases in use have brought problems of crowding, conflict, and resource deterioration. Managing agencies have responded by establishing carrying capacities, thereby limiting use. Once use is limited, however, space on the river becomes a finite resource. If the number of river runners exceeds the established use limit, a mechanism is needed for deciding "who gets to go." Permits are usually required, and some people are turned away. Allocating river access has become one of the most controversial aspects of river management, involving heated public debate, political maneuvering, and law suits. Public resource agencies have received the dubious privilege of overseeing the process.

It is important to distinguish between the carrying capacity and allocation issues, although the two are closely related. Carrying capacity determines the appropriate number of people for a particular kind of river experience; it involves setting a limit. Allocation distributes this limited number of river running opportunities among users; it means deciding who will get to go when demand exceeds capacity.

This project was designed to explore the allocation issue as it relates to river management. The introductory section discusses the general allocation principles which have been developed in economics, sociology, and political science, including the criteria by which allocation systems are judged and the conflict which often results from resource scarcity. Section II describes current systems for allocating river use, including the user "publics" involved, their differing allocation goals, the split allocation system which has developed, and the value which river access has acquired. Section III explores the advantages and disadvantages of alternative allocation mechanisms, including pricing, queuing, merit, reservation, lottery, and less restrictive measures such as redistributing use. Section IV describes the specific situation in Hells Canyon which prompted this study, and Section V outlines a general procedure for approaching allocation problems as well as specific recommendations for a new allocation system in Hells Canyon. The conclusion points out the need for an integrated approach to river allocation.

#### NORMS FOR ALLOCATING RESOURCES

Allocation only becomes an issue when resources are scarce, i.e., when the quantity demanded exceeds the available supply. Scarcity, then, requires distributive justice, which means allocating resources in a "fair" manner (Homans, 1961). Injustice can result from the values on which allocation is based, the rules for allocation, the implementation of the distribution process, or from the exclusion of certain groups from decision making (Deutsch, 1975).

The most common criteria for distributive justice are equality, equity, need, and/or efficiency. Equality means that individuals have

the same right to certain benefits. There are two ways of achieving equality: 1) give all persons an equal share, or 2) give all persons an equal chance to obtain benefits. Suppose that six people on a river trip are sharing one case of beer. The first form of equality would give each person four cans. The second form would probably not be used unless the group had only one or two cans. Rather than dividing them, our river runners might draw straws, guess numbers, or use some other mechanism which gave each person an equal chance to win but awarded a whole can of beer to the winner. Similarly, we might have six hunters and six hunting permits. "Equal shares" equality would give each person 1 permit while "equal chance" equality might assign each person a number from 1 to 6, roll a die, and give the winner all six permits. Where benefits are divisible, the first form of equality is usually used; where benefits are not divisible (such as 27 persons wanting 1 permit), the second is probably preferred (Pauly and Willet, 1972).

Equality is not always "fair," so in some situations people resort to unequal but presumably more fair allocation norms. Equity is a term with several meanings, but in allocation it refers specifically to "fairness." This has most often been defined as the ratio of "inputs" to "outcomes" for each individual (Walster et al., 1973). The contention is that if inputs are unequal then outcomes should be proportionately unequal. For people on a river trip, equity might mean dividing the beer (outcome) in proportion to the amount of "beer money" contributed by each individual (input). Equitable distribution is often more complex than equal distribution because there are many dimensions for measuring both inputs and outcomes. For example, it appears inequitable that a resident Alaskan pays \$25.00 for a brown bear tag while nonresidents pay

\$250.00. But residency connotes additional inputs (such as taxes), and nonresidents may place a higher value on the right to hunt (increasing their outcomes).

Recognizing need is another way of trying to assure fair rather than equal distribution; some individuals may have different requirements than others. In dividing beer on the river, some people may "need" more to quench their thirst or to put them in a relaxed state of mind. Giving larger shares of food to people who are larger, more active, or more hungry is another obvious example, and in game management some permit systems give priority to subsistence hunting. Similarly, land owners are often given special access privileges on rivers which have private inholdings. Need is often disregarded in favor of equality or equity because need is difficult to define.

Social efficiency is maximized when a resource is put to its most highly valued use. Some people really like beer, for example, while others would rather drink river water; efficiency requires that the allocation reflect this difference in value. Similarly, fine peeler logs can be used for firewood or chipboard, but it is more efficient to use them for making plywood because we can substitute less valuable resources for use as firewood. In relation to river access, imagine 5 permits to be distributed among 10 persons. If the value placed on the permit by each individual differed, ranging from 1 to 10, maximum efficiency would occur when those with potential benefits of 6, 7, 8, 9, and 10 were given permits (total benefit = 40). If anyone else were substituted, net benefit would decrease. The point is that tastes vary, and people value different experiences differently. Some might be willing to give up golf, skiing, fishing, desserts, and a \$1,000 bill to run a particular river,

while others would just as soon visit Disneyland, climb a mountain, or watch a stock car race. If the goal is to maximize the value of the resource, use needs to be shifted to those who value river running the most. The obvious problem lies in determining value.

To summarize, equality, equity, need, and social efficiency are all important factors in resource allocation. Equality is probably the simplest criterion; "all" it requires is equal opportunity or equal outcome. Equity, need, and efficiency are more complex because they require some means of assessing costs and benefits (value) for different individuals. In market economics, value is expressed in monetary terms, although economists recognize that dollars may have different values for different people (e.g., rich people vs. poor people). The assessment of value becomes increasingly difficult with nonmarket commodities such as recreation. Here the criteria for comparing values may include money, time, opportunities foregone, the effort invested in acquiring skills or equipment, or the availability of substitute activities. The complexity of these factors makes equitable and efficient allocation quite difficult. There are also trade-offs made in moving from one norm to another, which increases the difficulty of deciding on a norm or combination of norms. Past research suggests that equity is preferred when production or efficiency is the goal, while equality is stressed when units of comparison are unclear or when the goal is to reduce conflict (Leventhal, 1976; Deutsch, 1975).

#### CONFLICT AMONG GROUPS

Scarcity of resources creates a situation in which several factors foster the development of conflict (Deutsch, 1973). The competition

implicit in scarcity is an obvious factor. Social change is another factor which shifts the basis of various interests and creates a situation in which conflict is likely to develop. Finally, anything which identifies or increases group differences will promote solidarity within groups and increase the likelihood of conflict with out-groups. The cohesiveness within a group is also increased by physical proximity, amount of communication, success of the group, and the perception of threat from or conflict with outside forces. People are more likely to engage in collective action to further group goals when group size is small, the logistical costs of meeting and organizing are relatively low, and potential individual rewards are relatively large (Olson, 1975). In-group solidarity doesn't necessarily cause conflict between groups, but it does set the stage. Conflict may be decreased when people belong to a variety of groups which have different, cross-cutting interests.

As conflict develops, the power of a group to achieve its goals becomes an issue (Deutsch, 1973). Groups which are satisfied with existing relationships develop rationales for maintaining the status quo; it is likely that they will see change as a threat which would leave them in a powerless position. Groups with less power are more dependent on others. They may attempt to change power relationships by increasing their resources, finding allies, increasing the costs of power for more powerful groups, or inducing powerful groups to use their power benevolently (often through appeals for equality or equity). Changes of the status quo are more likely to be accepted if all groups expect to gain than if one will gain at another's expense.

The allocator's role varies greatly, but is likely to include preservation and protection of resources, specification of the goals or

values on which allocation is based, definition of rules for allocation and proper resource use, implementation of the allocation system, delegation of the authority to re-allocate, and supplying additional resources whenever possible. The allocator is obviously in a position to either alleviate or exacerbate conflict.

These concepts help in understanding conflicts over river use, and many findings from earlier studies are mirrored in the private-commercial controversy. For example, a river allocation system may have to be designed quite differently depending on whether the goal is equality or equity. The conditions for conflict among groups also exist in the river allocation situation, including scarcity, the potential for unpredictable change, the official designation of distinctly different groups (private and commercial), and differing degrees of group solidarity and willingness to engage in collective group action. It also appears that the private and commercial groups have different amounts of power and different interests regarding the status quo, and both groups have used the courts to make unilateral actions by managing agencies costly if not impossible. Finally, agencies have discovered from sometimes painful experience the difficulties inherent in the role of allocator.

## II. CURRENT ALLOCATION SYSTEMS

There are several kinds of resources involved in river running, and it is helpful to distinguish among them. Resources can be categorized as physical or non-physical. Physical resources are "things" which have value to people, including natural objects (such as trees and water) and man-made objects (such as cars and buildings). Non-physical resources are less tangible assets such as education, knowledge, labor, or aesthetic

qualities. River running includes both kinds of resources. Physical necessities include natural objects such as the river and canyon as well as man-made objects such as rafts, oars, and sleeping bags. Non-physical resources include river running skill and, on regulated rivers, access rights to the river.

The point is that all these resources are necessary for a river running experience. The public at large owns the river-canyon resource, and managing agencies provide access privileges for groups or individuals. River running equipment and skills are provided by outfitters or by users themselves.

#### PRIVATE AND COMMERCIAL GROUPS

For the purposes of allocation, users have traditionally been divided into two groups, "commercial" and "private." Commercial trips are offered by outfitters who are in the business of running rivers, and they have "blocks" of access privileges. Passengers pay a fee, and the outfitter provides the necessary equipment, skill, and access. A part of trip revenue is profit for the outfitter.

Private trips, by contrast, are less formally organized by non-commercial "do it yourselfers." A group of private users possesses the necessary equipment and skill, but must acquire access privileges from the agency on a trip-by-trip basis. Private permits are granted on the assumption that trip members are sharing costs, with no one realizing financial gain from the venture (Interagency Whitewater Committee, 1976).

Allocations to these two groups have generally been made in one of two ways. The first is a simple 50-50 split; there are two groups, so each should get half of the "user pie." Although this division is



equal (because there are two groups), it is usually arbitrary and would be inequitable (and unequal on an individual basis) if, for example, one group were much larger than the other.

The other means of "dividing the pie" has been to base the division on established use during some base line period. A period is selected, the percentage of use in each sector determined, and those percentages become the basis for future allocations. This kind of division can also be arbitrary, since it does not (in its current form) allow for changes in the composition of the user population. The obvious problem with both options is that there is no reliable information about the amount of use desired by each sector. Equitable allocation requires either information about demand or a system which can operate independent of such information.

As the competition for space on rivers has increased, arguments have developed between the private and commercial sectors about the amount of use each group "ought" to have. The major points in the controversy have been discussed elsewhere (Shelby and Nielsen, 1976), but they will be briefly summarized here. In favor of commercial trips, it is argued that:

- 1) outfitters provide a service to that portion of the public which "wants to be outfitted;"
- 2) outfitters have faced use limitations similar to those imposed on private boaters;
- 3) managing agencies feel some degree of obligation to assure that commercial trips are available for those who wish them;
- 4) outfitters have made significant contributions to equipment development and resource preservation; and
- 5) it is more convenient for managers to deal with a small group of professionals.

Arguments in favor of private trips are: 1) the "demand" for private trips have increased in recent years, generally with no increase in use allocations; 2) the higher

cost of commercial trips is discriminatory against private "do it yourselfers;" 3) recreational interests in public lands are held in trust for the "indefinite public," and should not be allocated to commercial interests which can monopolize them, and 4) commercial trips encourage use by people who otherwise would not run rivers, thus displacing those who have developed river related skills on their own. Private users also argue that permit application procedures are more cumbersome for them than they are for commercial users.

#### Distinguishing User Publics

In considering these arguments, it is most useful to distinguish three different segments of the "user public" (Shelby and Nielsen, 1976). Commercial outfitters form one segment, and they represent their own profit interest in addition to any more generalized interest in river running. Outfitters are relatively well organized because their numbers are low (17 on the Snake, 21 in Grand Canyon), they are usually concentrated geographically, many belong to formal associations which meet regularly, they interact regularly with agency personnel, and the potential individual gain from collective action is high (an outfitter stands to retain or acquire an allocation which is large enough to support a business and which may be worth a considerable amount of money). The number of outfitters on a given river is generally limited to those who were "in business" when the managing agency decided to regulate use. Each outfitter is given a specific allocation of use (user days, launches, etc.) which he/she controls. The size of the allotment depends on a variety of factors, usually including previous use.

Commercial passengers and private users form two additional segments, and they share a recreational interest in running rivers. Commercial

passengers presumably want to be "outfitted," a service provided by outfitters which has usually included procuring a space on the river.

Commercial passengers thus have little reason to interact with managing agencies, and they have been notably absent in public involvement concerning allocation. They are not usually organized except by the mailing lists of outfitters. It is often assumed that outfitters represent the commercial passenger group, an assumption that may result in the confusion of outfitters' profit motives with the recreational motives of their passengers.

Private boaters want to run their own trips. In the past their only organizations were local activity-oriented clubs, but recently ad hoc groups (such as the Wilderness Public Rights Fund) have formed around the allocation issue. In spite of a shared "cause," most factors work against unified political action. Private boaters are numerous, geographically scattered, most do not meet regularly, they do not have regular meetings with managers, and the potential individual gain from collective action is low (a person usually stands to gain access individually or for a single trip). Private permits have traditionally been acquired by a trip leader, who in turn selected other trip members. Some rivers now require trip members to be listed on the permit application, and some limit the percentage which can be changed.

These discussions often seem to imply that private and commercial users are radically different. Research done in the Grand Canyon (Shelby and Nielsen, 1976) indicates that these two groups are remarkably similar in terms of standard background characteristics. There are no significant differences in education, occupational status, marital status, number of children, or past residence. The private user tends to be slightly younger, more predominantly male, has slightly less income, and is more likely to

live in a rural area. There are larger differences between the two groups on outdoor experience variables. As one might expect, those who run their own trips are more likely to belong to outdoor clubs, have had their first wilderness experience earlier, have more experience running rivers, and are more likely to participate in other outdoor activities. Recent studies on the Rogue River in Oregon essentially replicate these findings (Shelby and Colvin, 1979).

Private trips are usually conducted differently from commercial trips (Shelby and Nielsen, 1976). In Grand Canyon, they tend to have less people, more boats, and less people per boat than commercial trips. They spend a longer time in the Canyon, and visit a greater number of attraction sites. Commercial oar trips differ from commercial motor trips in these same ways, but to a lesser degree (all private trips were oar trips).

#### ALLOCATION GOALS OF DIFFERENT GROUPS

The preceding section suggests that different groups may have different ideas about what an allocation system should accomplish. To explore this, we met separately with managers (Interagency Whitewater Committee), outfitters (Idaho Outfitters and Guides), and private users (an informal group organized by John Garren and ourselves). At each meeting, the group was asked to brainstorm about and then prioritize allocation goals. We later developed a comprehensive list of 16 goals integrated from the three sessions. The list was sent to the original participants and others, asking them to select their top five goals. The goals of each group were prioritized using a simple averaging procedure. The comprehensive list, response rates, and the complete rankings for each group can be found in Appendix 1.

Managers, outfitters, and private boaters share several concerns. All

three groups felt that an allocation system should be simple and easy to understand, with a minimum of "red tape," and efficient, minimizing "no-shows" and making unused launches available to other users. These two goals ranked in the top six for each group (see Table 1), and they provide points of consensus on which a system could be based.

Aside from this agreement, the three groups have quite different concerns. Managers felt that a system should: be defensible to diverse groups and fit legal and budgetary constraints; be responsive to the relative amount of use "demanded" by each sector; maximize use (fill available "slots") within environmental or social carrying capacities; be flexible (allow for changes in plans, group composition, weather, etc.); and provide business stability for outfitters. These goals reflect the constraints and political pressures faced by managers as well as their responsibility for accommodating unforeseen changes.

Outfitters have a somewhat different point of view. Their primary concern was that the system provide stability for their businesses. Another major concern was that procedures for obtaining a permit should be different, with outfitters distributing permits to commercial users and the managing agency distributing them to private users. Outfitters also felt that the system should penalize those who attempt to cheat, holding users and outfitters responsible for breaking the rules, and that user groups should not be given preference on the basis of past success, historical use, etc. The first two goals reflect outfitters' need for some kind of stability and their desire to maintain control of commercial allocations. The third goal may indicate a feeling that private users are beating the system or acting irresponsibly at outfitters' expense, and the fourth probably reflects a belief that a preference system would disadvantage commercial passengers.

TABLE 1

## RANKED ALLOCATION GOALS OF DIFFERENT GROUPS

Managers

- 1) The permit system should be simple and easy to understand, with a minimum of "red tape" for users, outfitters, and managers.
- 2) The permit system should be defensible to diverse groups and fit legal and budgetary constraints.
- 3) The permit system should be responsive to the relative amount of use "demanded" by the private and commercial sectors.
- 4) The system should be efficient by minimizing "no-shows" and making unused launches available to other users.
- 5) The permit system should attempt to maximize use within environmental or social carrying capacities (i.e., an attempt should be made to fill all available "slots" on the river).
- 6.5) The system should be flexible (allow for changes in plans, group composition, weather, water levels, etc.).
- 6.5) The permit system should provide business stability for outfitters.

Outfitters

- 1) The permit system should provide business stability for outfitters.
- 2) The permit system should be simple and easy to understand, with a minimum of "red tape" for users, outfitters, and managers.
- 3) Penalize applicants who attempt to "cheat" the system; hold users and outfitters responsible for "breaking the rules" (including bogus applications, no-shows, environmental damage, etc.).
- 4) Procedures for obtaining a permit should be different: outfitters should distribute the commercial users' permits and the managing agency should distribute the private users' permits.
- 5) The system should be efficient by minimizing "no-shows" and making unused launches available to other users.
- 6) Users should not be given preference according to past success at obtaining permits, historical use of a river, relative value they place on river running, or demonstrated environmental skill.

TABLE 1 (continued)

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Private Users

- 1) Procedures for obtaining a permit should be the same for all users, regardless of whether they want to float a river on their own or with an outfitter.
  - 2) Permits should be issued to individuals, who then arrange the group, either private or commercial, with which they want to float the river.
  - 3) The permit system should avoid encouraging use by limiting advertising or promotion of river running.
  - 4) The system should be flexible (allow for changes in plans, group composition, water levels, etc.).
  - 5) The permit system should be simple and easy to understand, with a minimum of "red tape" for users, outfitters, and managers.
  - 6) The system should be efficient by minimizing "no-shows" and making unused launches available to other users.
-

The top two goals of private users were that procedures for obtaining a permit should be the same for all users and that permits should be issued to individuals, who then arrange either a private or commercial trip. The first is essentially a concern for equality in what private users feel to be an unequal and inequitable system, the second represents the alternative permit system most often supported by this group. Private boaters also felt the system should avoid encouraging use by limiting the promotion of river running. Many of them feel that advertising by commercial outfitters is crowding the rivers with commercial passengers who would be just as happy with some other form of recreation, displacing private users who presumably place a higher value on the experience. Finally, private boaters felt that any system should be flexible, allowing for changes in plans, water levels, etc.

#### SPLIT ALLOCATIONS FOR PRIVATE AND COMMERCIAL USE\*

When it became necessary to limit use, most agencies simply developed allocation systems which approximated the way permits had been issued in the past; no one at that point questioned the desirability of separate allocations for private and commercial use. But as demand continued to exceed capacity, users first contested the percentage allocated to each sector and later argued against the concept of split allocations. These attempts to change the system had potential for success because allocation is political.

As was discussed earlier, increased demand is likely to increase the cost of gaining access (money in the commercial sector, time and hassle

\*This section makes extensive use of reports from Parent (1978a) and Baden and Stroup (1978). Their contributions are acknowledged here to avoid interrupting the text with frequent references.



in the private). Some people will be priced out of commercial trips. These people can either engage in political action to change the system, attempt to substitute a private trip, or substitute a different recreational experience (another river trip or a non-river experience). But if commercial passengers place a relatively low value on the river experience, they would not engage in political activity; they would be more likely to substitute a private trip or try some other experience. In the latter case they no longer concern us. But if "priced out" commercial passengers attempt to substitute a private trip, everyone in the private sector has a lower probability of getting a permit. This means that private users who place a relatively high value on the experience are more likely to be denied access.

Private users then have three options: engage in political action, substitute a commercial trip, or substitute a different recreation experience. Private boaters usually have a more substantial investment in equipment and experience, so they are unlikely to give up river running. They also appear reluctant to go on commercial trips (primarily, we think, because they want to run their trips independently, although cost is often mentioned). That leaves political action, and private boaters have engaged in efforts to get permits for themselves as well as to change the allocation system.

Essentially, then, high-valuing private boaters have invested part of their consumer surplus in political action, just as commercial outfitters have invested part of their economic rents in similar activity. Commercial passengers have generally avoided political action, choosing instead to pay more money, substitute a private trip, or substitute some other activity. The preceding analysis has been theoretical rather than empirical, although it appears to fit what is known and makes sense in terms of economic and political theory.

### Are Split Allocations Defensible?

Existing split allocation systems represent the way things have been done in the past. They are already developed and operating, they have been reasonably successful, and they are familiar to managers, outfitters, and users. But it now appears that existing systems have important unintended consequences; they should be carefully evaluated in terms of allocation goals such as equality, equity, efficiency, and need.

Current split systems aren't equal. Procedures for gaining access are different for commercial and private users, who "pay" in different currencies (money versus time and hassle). On high demand rivers such as the Colorado in Grand Canyon, commercial users apparently have the potential for more trips (unequal shares) and a greater likelihood of getting on a trip (unequal probability).

As far as we know, no river permit systems evaluate inputs in an attempt to make outcomes equitable. As will be discussed later, some hunting permit systems do so by giving preference to groups such as residents or those who have been unable to get a permit in the past. In these systems, inputs are defined as taxes paid or the effort expended on unsuccessful applications, and outcomes are defined as the chances of getting a permit; those with greater inputs have greater outcomes. Achieving equity of a more profound nature would require some very difficult assessments. For example, current river systems allow commercial users to pay with money while private users pay with planning and the time involved in getting a permit. Because the currencies are different, the inputs are hard to compare, even if the amounts of money and time could be specified. Comparing outcomes is at least equally problematic; the more profound benefits obtained

from a river experience are extremely difficult to measure and evaluate.

The extent to which split allocations are efficient is unknown.

Efficiency requires an assessment of the value of the resource so that it will be used by those who value it most highly. The current system may be efficient within the commercial sector; people willing to pay are those who get to go, and others are priced out. Within the private sector, however, lotteries tend to provide equal allocation, which is inefficient because it does not favor those who place a higher value on the experience. It is unlikely that split allocations are efficient between the two sectors, but it is difficult to tell because the two groups pay in different currencies.

Current systems recognize need in several ways. Most agencies provide for access by property owners, and some have set up special allocations for social service or educational groups. It is often argued that outfitters or lodge owners require river access for their livelihood, so their allocations are also a recognition of need.

#### Making Split Allocations Work

Split allocation systems have the advantages of incumbency. But a number of questions have been raised, and maintaining the status quo will mean defending it. Split systems are difficult to defend without accurate information about demand in the private and commercial sectors. Agencies have tried to estimate demand using private permit applications and the number of commercial "turn aways," but these measures are unreliable and subject to manipulation. Survey techniques might be helpful, but would be expensive. Any assessment of demand will also require forecasting and/or updating, because demand will probably change over time. It may also be necessary to determine the percentage of private demand created by those

priced out of the commercial sector, or the percentage of commercial demand made up of private users unable to get a permit.

The need to know demand is based on the assumption that allocations must be split. As was noted earlier, agencies developed split allocations because they were convenient at the time. It makes little sense to perpetuate such systems unless they accomplish allocation goals. We suggest working from goals and objectives to a specific system, as outlined in a later section. If a split allocation is necessary, a way to estimate demand can be found.

#### SPACE ON RIVERS AS A SCARCE RESOURCE

The central question is, "Who gets to use the scarce resource, and how will those people be chosen?" The "scarce resource" is space on the river, which managers measure in units called "user days."<sup>1</sup> In American society, the usual means for allocating scarce resources is the market system. In such a system, an excess of quantity demanded should cause the quantity supplied to increase and/or the price to rise. The number of people who want to run rivers is increasing, but the supply of available spaces has been limited by carrying capacities. If use were allocated by a market system, then, prices would increase until users unwilling to pay more were eliminated and the quantity demanded equalled the prescribed capacity.

It appears that the market mechanism is free to operate in the commercial sector. Although the supply of spaces on the river is fixed by

<sup>1</sup>A user day is here defined as one person using the river for part or all of one day. Other units have also been used (e.g., visitor nights, trip launches), and this discussion applies to them as well.

managing agencies, it is possible to raise the "price" of a trip (either in dollars or by other methods such as requiring a reservation, collecting deposits, or cutting services). Good business practice would suggest such an increase rather than spending time and money turning away customers who couldn't be accommodated. It should also be noted that the quasi-monopolistic position enjoyed by outfitters is a result of agency limitations on number of outfitters and amount of use rather than a result of monopolistic practices by outfitters themselves.

The point is that this kind of increase in price is an economic "rent" which reflects the value of space on the river (as distinct from the outfitter's services, which also have a value). User days have taken on a monetary value, in spite of the contention by managing agencies that "passenger days are not a saleable commodity" (Interagency Whitewater Committee, 1976). User days can in some cases be legitimately traded (Yearout, 1975), it is rumored that they can be bought or sold, and it seems obvious that the net worth of an outfitter's business (i.e., equipment, real estate, mailing lists, etc.) is greatly enhanced if an allotment of user days can be assured.

The recent sale of several outfitting businesses provides some limited information about the value of use allocations. It is difficult to specify the price of the use permit by itself because the agencies' refusal to recognize a permit transfer requires the buyer and seller to pretend that only a business (equipment, buildings, etc.) is being sold. But Table 2 combines our best estimate of black market permit prices with information about average trip size and length and the assumption that the cost of the permit will be amortized over 5 years. The results

TABLE 2

## ESTIMATED VALUES OF COMMERCIAL ALLOCATIONS

River	Price of Permit <sup>a</sup>	Allocation (Passenger Days Per Year)	Value per Passenger Day <sup>e</sup>	Percent of Commercial Allocation Used in 1978	
				Launches	User Days
Colorado (Grand Canyon)	\$500,000 (1978)	10,000	\$10.00	--	99%
Middle Fork Salmon (Idaho)	\$ 19,000 (1977)	518 <sup>b</sup>	\$ 7.25	83%	55%
Rogue (Oregon)	\$ 1,250 (1978)	52 <sup>c</sup>	\$ 4.75	73% <sup>f</sup>	66% <sup>f</sup>
Snake (Hells Canyon)	\$ 10,000 (1977)	845 <sup>d</sup>	\$ 2.25	40% <sup>g</sup>	--
	\$ 20,000 (1979)	845 <sup>d</sup>	\$ 4.75	57%	30%

a Represents our best estimate of price for permit only.

b Assumes 6 launches x 16 passengers each x 5.4 days on river = 518.

c Assumes 1 launch x 13 passengers x 4 days on river = 52.

d Assumes 13 launches x 13 passengers each x 5 days on river = 845.

e Assumes 5 year amortization with no interest, rounded to nearest .25.

f These are 1977 figures; 1978 permit system used a "common pool" which made it non-comparable with systems on the other rivers.

g This is for the 1976 season, on which the sale was based.

suggest that permits have considerable value and that value varies depending on demand for the resource. The values range from about \$10.00 per user day in Grand Canyon to \$2.25 - \$4.75 in Hells Canyon.

In the private sector, space on the river has also been limited by use restrictions. In addition, however, the "price" of a user day is fixed (at zero) because trip members are sharing expenses only. The result is that there is no market mechanism to distribute the limited number of user days. Managing agencies have had to invoke various non-market allocation mechanisms to distribute private permits at no charge, including "first come, first served," one trip per season, one trip every other season, and lottery drawings. The value of access (the difference between what private users would be willing to pay and what they actually pay) is captured by private users as consumer surplus, which represents another form of economic rent. It is rumored that user days can also be bought or sold in the private sector, but such transactions are difficult to track down.

The upshot of this is that what was supposed to be a "free public resource" has become an economic commodity (as a result of its scarcity). It was originally intended that space on the river, which managing agencies held in trust, was to be distributed to the public at no charge. The agency's job was to see this was done in a fair and efficient manner, without undue damage to the resource. In the commercial sector, there was the added responsibility of assuring that the outfitting services available were of high quality. However, allotting blocks of the scarce commodity (user days) to either commercial outfitters or private trip leaders apparently defeats these original intentions, since it allows someone outside the agency to reallocate user days to individual users. By doing so the allocation system essentially allows individuals,

particularly outfitters, to acquire and control access rights to public river running resources.

The notion that allocations have no economic value is simply untrue; it should be replaced with the frank recognition that access rights to rivers are worth a great deal. But this recognition creates a major problem: Who should capture the value of a public resource? Should access rights be given away? Should agencies sell access to users? Should agencies sell access to entrepreneurs, who in turn re-sell to users? Should agencies give access to entrepreneurs, who in turn sell to users?

The answers to these questions are based on values, and research can't make value judgments for either managers or the public. But research can specify the consequences of different alternatives, thereby providing better information on which to base decisions. The foregoing discussion suggests that current allocation systems take public resource access rights and give them at little or no cost to outfitters and private trip leaders, who are then in a position to reallocate (and perhaps sell) those rights back to the public.

### III. ALTERNATIVE ALLOCATION SYSTEMS

People use a variety of methods for allocating scarce resources. This section describes the five allocation alternatives identified in Stankey and Baden's (1977) paper on rationing backcountry use: pricing, queuing, merit, reservation, and lottery. Pricing and queuing have been thoroughly studied by economists and are fairly well understood; these two alternatives will be described briefly. Rationing by merit is a relatively untried option which will also be discussed briefly.



Reservation and lottery systems are widely used but have received little formal scrutiny; they will be discussed briefly in the text, but are treated in depth in Appendices 2 and 3. It should be pointed out that most allocation systems combine one or more of these five mechanisms in order to achieve allocation goals.

The reader will recall that equitable or efficient allocation requires an assessment of value. Value can be measured as how much a person is willing to give up to consume a commodity or as how much a person would have to be compensated to forego consumption. We most frequently think of value in terms of dollars, but other commodities such as time, effort, knowledge, or skill obviously have value also. As a "pure" concept, price refers to the amount of any commodity which is paid to receive another commodity. In the following discussion price will refer only to the payment of money.

#### PRICING

Many valuable resources are distributed by pricing in a market system. This is particularly true of private property resources because the owner can make unilateral decisions about selling. Common property resources are less likely to be marketed, especially when the property owners are numerous and the managing entity does not have clear guidelines for pricing and marketing. Public recreation resources are usually non-market commodities, although one can think of examples where contracts allow marketing (ski areas on public land) or where fees are charged in a quasi-market (public campgrounds).

In simplest terms, a market adjusts the quantity supplied and/or the price until supply equals demand. In the case of river recreation, supply is limited to the carrying capacity. In general, then, pricing

would mean charging a fee during times when demand exceeded carrying capacity. The fee would have to be high enough to cause those less willing or less able to pay to drop out of the market, decreasing demand until it equaled supply.

Pricing has several advantages. It encourages consumers to prioritize their desires, commodities are presumably distributed to those who value them the most (resulting in equity and efficiency), and demand is "automatically" balanced with available supply. Pricing would eliminate artificially low (zero) prices which encourage those who place little value on an experience to compete with people for whom the experience is important. Pricing would also require those who use the resource to pay for it, rather than having all taxpayers subsidize the recreational pursuits of the river running minority. It might even be possible to use revenues to provide alternative opportunities (such as softball diamonds) for those who don't use rivers.

There are also disadvantages of pricing. Efficiency may not be maximized because income is unevenly distributed; pricing discriminates against those who are unable to pay as well as those who are unwilling, and a person with little money who places a high value on river running might be squeezed out by a casual river runner with a higher income. However, the cost of a permit would probably be low in relation to the total outlay for equipment, food, travel to and from the river, and time and opportunity costs, and it appears that people who could afford these other costs could also afford a permit.

## QUEUING

Queuing means waiting in line or "first-come/first-served" (FC/FS).

It is similar to pricing, but time rather than money is traded for the desired commodity. Queues are commonly used for admission to popular shows, sports events, or concerts, usually in combination with pricing. Queues have been used in backcountry permit systems, either for some percentage of use or for unclaimed reservations.

The advantage of queuing is that, like pricing, it allows individuals to assess the value of the resource in relation to their willingness to pay (in this case the time required to "get in"). Some argue that allocation by time is the most fair because time is evenly distributed; we all have 24-hour days. But there are also disadvantages to queuing. Time is worth a great deal to those with structured and busy lives, but has relatively less value for those with fewer demands; queuing therefore discriminates against those whose time is "precious." Because most rivers are in remote areas, queues for permits might cause other problems. If queues were held on the day of departure, people wouldn't know whether to plan for success or failure; if they were held in advance, people would have to make two trips. Queuing might also require facilities and administration for the people waiting in line (an added expense), and time spent waiting is "lost" for everyone (whereas a monetary fee becomes someone else's gain).

## MERIT

A merit system would distribute permits on the basis of some demonstrable skill, knowledge, or past behavior. The idea is that people prove their commitment and qualifications by investing whatever it takes to

acquire merits. This is a relatively untried option, but qualifying exams for government employees, safety courses for hunters, or tests for drivers provide some examples. Comparable experience is already required on some rivers, which is an indirect merit requirement. An interesting variation proposed by Outdoor Program participants at the University of Oregon would allow people to earn merit points by working on ecology-related projects such as recycling or litter pickup.

Merit tends to be used for establishing minimum qualifications rather than for choosing from a surplus of qualified persons. The ability to eliminate the unqualified appears to be its primary advantage, although the time, effort, and money spent acquiring merits would encourage users to assess the value of the experience and might increase social efficiency. Requiring merit beyond minimum qualifications creates serious difficulties in deciding what makes a person "worthy." Add to this the problems of subjective judgement, favoritism, and possible black markets, and administration might be a nightmare.

## RESERVATION

The notion of making a reservation is familiar to most of us. Spaces in airplanes, trains, hotels, and restaurants are often reserved through world-wide computer networks, although many reservations are handled by simpler systems. All reservation systems have one common effect: they place a premium on advance planning. People who reserve their "spot" the earliest are the preferred "customers." This emphasis on planning distinguishes reservations from other rationing techniques.

Reservations have been used for a variety of public recreation resources, but campgrounds are probably the best and most thoroughly

documented example. An extensive review of campground reservation systems is presented in Appendix 2; it discusses the uses of reservation systems, administrative problems, and possible solutions. The effects of such systems are not always consistent, but the following generalizations appear justified.

1. Reservations favor users who can and do plan ahead, so not everyone benefits from the change to such systems. Identification of and provision for users who do not plan ahead is important to avoid their exclusion.
2. Reservation systems involve a wide range of variables, including automation, centralization, method of making the reservation, and specific reservation policies. These should be carefully evaluated in light of agency goals and constraints because they significantly affect efficiency and acceptability of the system.
3. No-shows remain one of the significant drawbacks to reservations. Methods to reduce no-shows include prepayments, penalties, and adjusting the method by which reservations are made.
4. Reservation systems are expensive; it is important to consider who benefits from the service and who pays for it.
5. Overall use of campgrounds is reported to increase with reservations, probably as a result of visitor referral. Campers who would otherwise be turned away during peak times are referred by the system to less popular places or times (National Park Service, 1974; Burnett, 1973). This may result in more complete utilization of the resource.
6. Campgrounds using reservation systems show a significant reduction in visitor-related problems such as thefts and vandalism

(National Park Service, 1974). This is apparently due to either the type of users most likely to make reservations or the accountability which results from recording names and addresses.

7. Users who obtain satisfactory reservations will be happy with the system; those turned away will probably be disgruntled, but may still support the system. Referral to available places or times is preferred to denial, both from an efficiency and a political standpoint.
8. Reservation systems are complex, but the effects of different variables on user behavior are rarely analyzed or considered. Agencies establishing new systems or changing existing ones should plan to collect data and monitor the effects.

## LOTTERY

Lotteries have long been used to make social choices and allocate scarce resources; examples range from draft lotteries to sweepstakes drawings. Game permit selection procedures represent the best example of lotteries for recreation resources. But these systems have not been well documented; when reports exist at all, they are usually unpublished, widely scattered, and limited in scope. In order to gain a more comprehensive view, we contacted game management agencies in the west and midwest and attended a conference on administration and licensing which focused on lotteries. A complete review is presented in Appendix 3. As with the discussion of reservation systems, the idea is to describe the issues involved in the use and administration of lotteries. The following generalizations can be made.

1. Lotteries are historically well founded and are legally sanctioned.

They are currently and widely used for allocating resources, and Americans take them seriously.

2. It is important that lotteries be and appear fair.
3. Lotteries in their "pure" form represent the "equal chance" method of achieving equality, where each applicant has an equal probability of selection.
4. Many lotteries are not "pure;" they have been modified to serve specified equity or efficiency goals such as giving previously unsuccessful applicants a higher probability of selection.
5. Lotteries are flexible in other ways. They can a) handle a great number of applications and/or of drawings; b) be used to distribute use and maximize individual choice; c) be manipulated to provide varying rates of "turnover;" d) handle group applications; and e) vary in cost and efficiency.
6. Lotteries may pose problems for commercial guides, particularly when they rely on return business.
7. There are other potential problems which need to be considered if lotteries are used for river permits, including fees, permit transfers, advertising, and quasi-commercial operations.

#### NON-RATIONING MECHANISMS: LESS RESTRICTIVE MEASURES

There are a variety of ways to reduce congestion or crowding without actually rationing use. Most problems are caused by concentrations of use, either in time (days of the week, months of the season, etc.) or space (launch areas, attraction sites, etc.). Mechanisms which distribute use more evenly will increase the available supply of space on the river, thereby alleviating the "pinch" created by high demand.

Such mechanisms are extremely valuable for increasing utilization and gaining political acceptance. For example, the recent river management plan for Grand Canyon lowered the daily launch limit for social capacity reasons. But distributing use over a longer season allowed an increase in overall use, accommodating a larger private allotment without substantially cutting commercial use. This kind of "no one loses" solution is very appealing.

There are limitations, however. These mechanisms require use limits, so physical, ecological, and social carrying capacities will still have to be carefully considered. In addition, re-distribution is only a temporary solution. If demand continues to increase, it is only a matter of time before the newly available supply of spaces will be filled. Allocation will be necessary at that point, so the issue will only have been postponed. Agencies shouldn't miss the opportunity for a "no one loses" solution by waiting too long to develop an allocation system.

#### IV. THE SNAKE IN HELLS CANYON

Most of this report applies to allocation problems on any river. There are, however, some aspects of the situation in Hells Canyon which are more unique. This section will describe current use and discuss the issues surrounding use by outfitters.

##### CURRENT USE

The Snake flows from northwest Wyoming to the Columbia River near Pasco, Washington. The uniqueness of the section which forms the Oregon-Idaho border was recognized by Congress with the designation of the Hells Canyon National Recreation Area (HCNRA) in 1975. At the same time, Congress included the 58 mile stretch downstream of Hells Canyon Dam in the Wild and Scenic Rivers System.



Whitewater boating is a popular activity on this section of the Snake. People launching at Hells Canyon Dam can float to Pittsburg Landing (33 miles) or the confluence with the Grande Ronde River (85 miles); most float the latter distance, averaging five days per trip (USFS, 1976). There are other activities which occur on or near the river, such as hiking and jet boating, but here we are only concerned with float-boating.

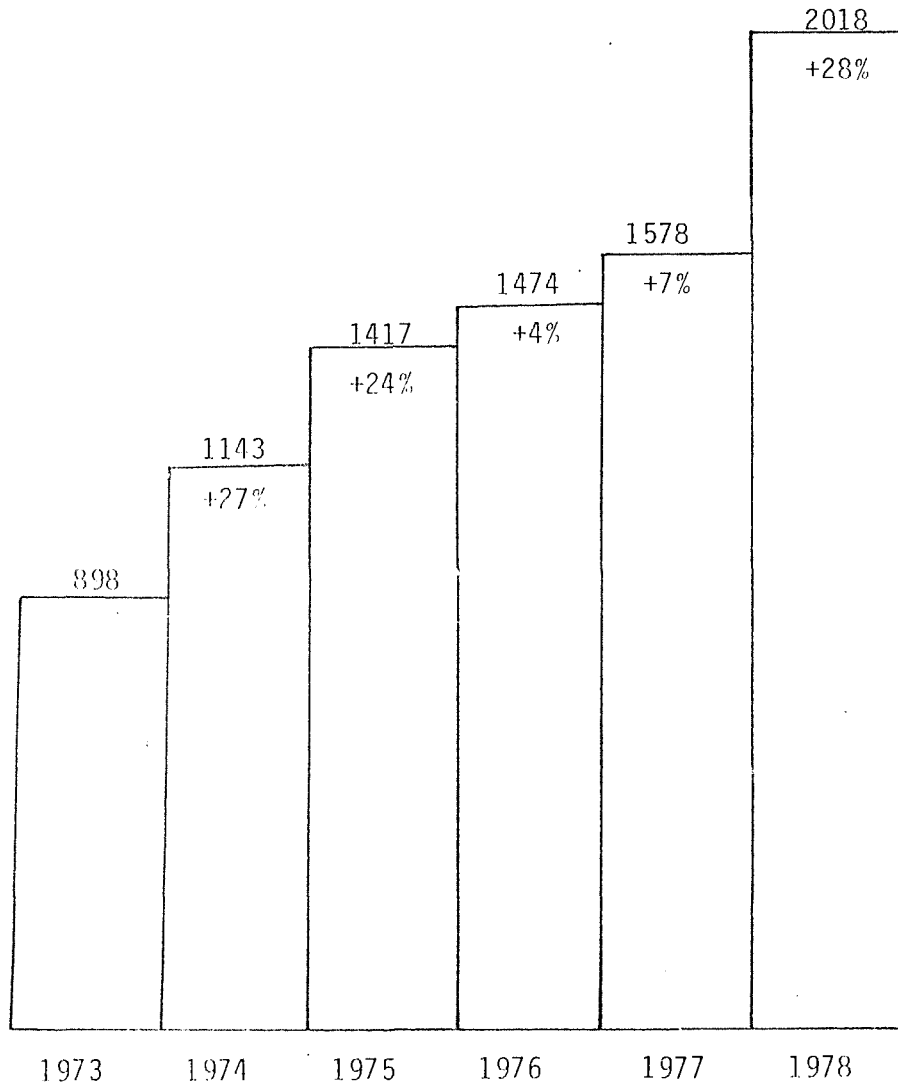
Float use in Hells Canyon has increased in recent years (see Figure 1). In 1973, a total of 1184 persons launched at Hells Canyon Dam; by 1978, this had increased to 3213 persons, an average increase of 22% per year. Increases in commercial use averaged 18% per year during this period, while increases in private use averaged 36%. As with other popular rivers, use on the Snake is not evenly distributed throughout the year (see Figure 2). For example, 991 people floated Hells Canyon in July of 1977, while 50 floated the same stretch in October. The vast majority of commercial use occurs in June, July, and August, while a fair amount of private use also occurs in September. Further analysis would probably show that use is higher on some days of the week than others, but these data were unavailable. What this means is that crowding and the potential need for rationing are greater at some times than at others.

Hells Canyon National Recreation Area is administered by the Wallowa-Whitman, Nez Perce, and Payette National Forests under the terms of an "Interim Management Plan." The plan controls float use with a permit reservation system. During the use season (May 21 to September 9), two commercial and three private parties may reserve a launch each day with a maximum of 30 persons per party. The system, then, allows a total of 150 persons per day, but because use is regulated by party, launch capacity can be "filled" with fewer people. In 1978, for example, private launches averaged

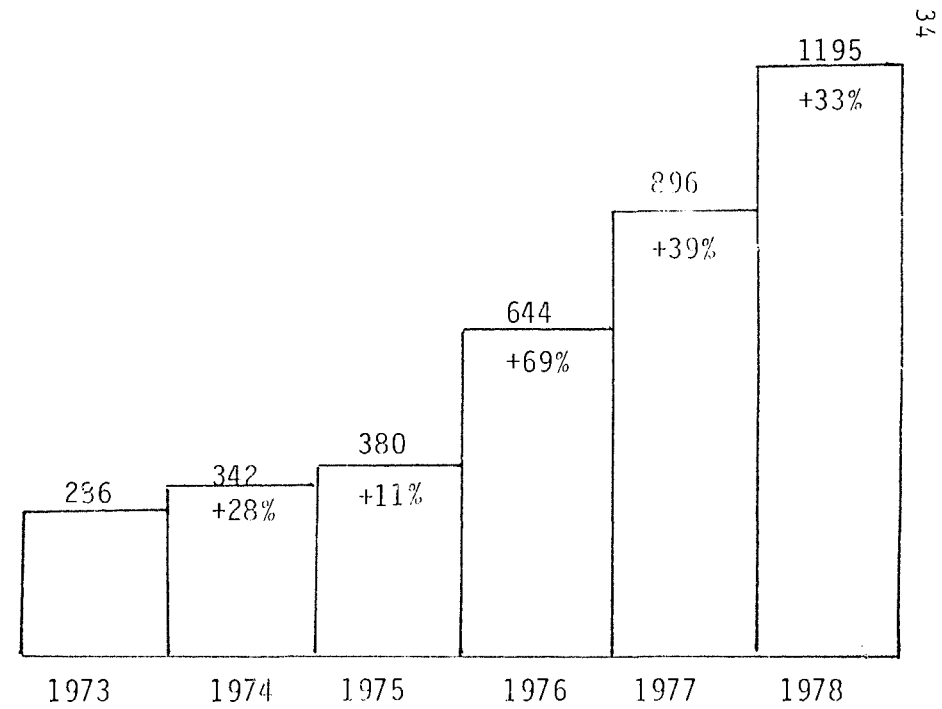
FIGURE 1

People Per Year  
Floating the Snake in Hells Canyon, 1973-1978:<sup>a</sup>

Commercial



Private



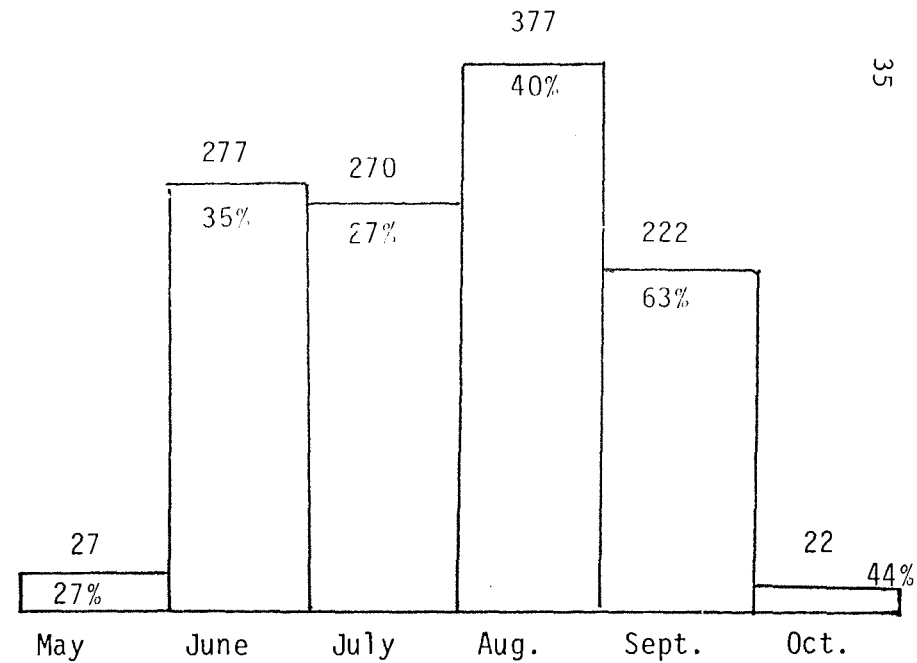
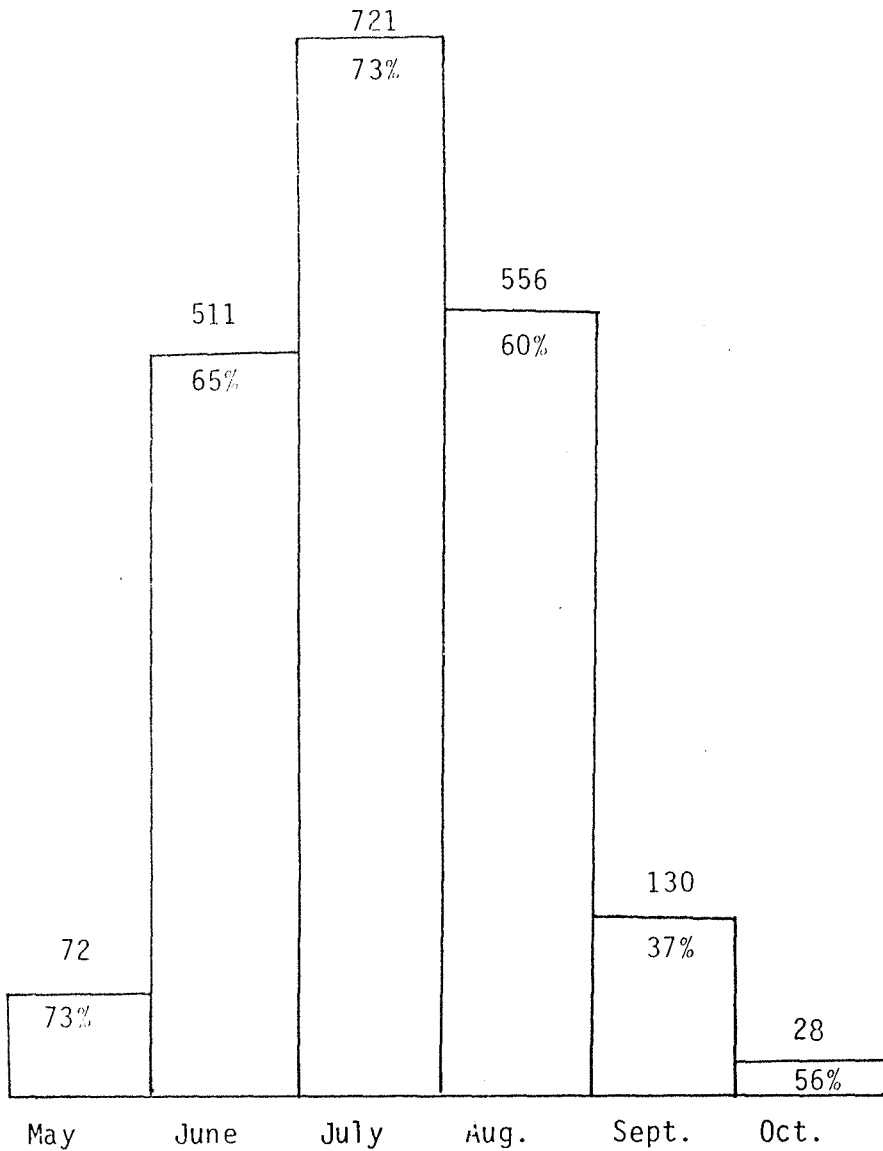
<sup>a</sup> Adapted from U.S.F.S. Data, Pine Ranger District, Wallowa-Whitman National Forest.

FIGURE 2

People Per Month Floating the Snake in Hells Canyon, 1978<sup>a</sup>

Commercial

Private



<sup>a</sup>Adapted from U.S.F.S. Data, Pine Ranger District, Wallowa-Whitman National Forest. Percentages represent relative use by each sector.

8 persons and commercial launches averaged 16. On a day where all allotments were filled with average sized trips, total people launching would be 56.

There are several good reasons for regulating the number of launches rather than the number of people. Physical carrying capacity is based on available campsites, and because the norm is one party per site, the canyon "fills" according to the number of launches rather than people. Similarly, social carrying capacity is based on the number of encounters among groups, which depends on the number of groups rather than the size of each one. Finding that the average number of people per trip is well below the allowable maximum suggests to us that agencies usually set the limit too high. In Grand Canyon, where the commercial maximum was 40 persons per trip, 57% of the users preferred groups of 20 or less and another 29% favored groups of 20-30 (Shelby and Nielsen, 1976).

Records show that commercial outfitters used 57% of the launches available to them in 1978, while private boaters used 44%. Both sectors, then, have space available to them. This under-utilization is an advantage at the present time because it should allow development of an allocation system without the political pressure typical of high demand situations. If agencies want to increase the utilization of available launches, recent experience on the Rogue River in Oregon suggests that placing unconfirmed launches in a "common pool" helps accomplish this. The problem is that most capacities are based on the assumption that use will approach the limit only on certain days (such as weekends), and launching the maximum every day may exceed physical or social capacities. If use continues to increase, popular rivers will approach full utilization even without a common pool. Agencies should be sure that the river system can handle maximum use.

The current allocation system on the Snake has come into question because of a protest by a private user. On a date when two commercial and three private launches were allowed, John Garren applied for a fourth private launch after the other three had been filled. Even though the Forest Service made a permit available to him, Garren chose to run the river without a permit to protest the current allocation system. In addition to specific complaints about the way permits are distributed, his concerns echoed the more general arguments of private users which were discussed earlier in this report.

The denial of Garren's application was upheld on appeals to the Regional Forester and Chief of the Forest Service (see Garren, 1977; Jorgensen, 1976; and McGuire, 1977; for further details). In responding to the case, two commitments were made. Jorgensen (1976) indicated that use ratios prescribed by the Interim Management Plan "can and will be changed . . . if use patterns indicate a different ratio would be more appropriate." Forest Service Chief John McGuire (1977) further indicated that "we will engage mechanisms to adjust the allocation ratio to demand levels which assure each type of user an approximate equal chance for a trip without prohibiting either."

#### OUTFITTERS IN HELLS CANYON

Commercial guides need to be considered in any allocation decisions; they are a vocal and politically well organized "public," all or part of their livelihood depends on river running, and they provide important services (as outlined earlier). Accordingly, the possible impacts of new systems on outfitters have received a great deal of attention. For example, Parent (1977) speculates that a lottery might have the following effects.

Outfitters who could afford to do so would invest in primary advertising to increase the size of the commercial sector, which would greatly increase demand for the resource. At the same time, both private river runners and small outfitters, who would be unable to compete with expensive advertising campaigns, would be forced off the river. The diversity of services offered by numerous small outfitters would be lost, private users would have little opportunity to run the river, and the already existing overdemand situation would be further exacerbated.

Such discussions quickly become extremely complex. The behavior of businessmen is based on a number of factors, ranging from well known business principles to unknown individual motives. The outcomes of policy changes also need to be considered in terms of value judgments about how commercial businesses and public resources ought to be "combined," as they are in commercial river running.

The point is that changes in allocation mechanisms will probably affect business behaviors, and it would be helpful to anticipate the changes which might occur. The only study which provides any documentation was done on the Snake River near the Grand Tetons in Wyoming (Parent and Robeson, 1977). The Park Service and Forest Service manage similar sections of the river, but the Park Service fixed the supply of trips by limiting use while the Forest Service allowed use to increase. From 1973 to 1976, trip prices increased on the NPS section but remained the same on the USFS section. Use was of course held constant on the NPS section but increased 25% per year on the USFS section, suggesting a general increase in demand as well as a shift from the higher priced trips to lower priced ones. The Forest Service was faced with problems of congestion and crowding.

There is little other evidence on which to base predictions about changes, although many people are willing to speculate. Given this, the next best alternative is to carefully document the present situation of outfitters in Hells Canyon; by collecting similar data in the future, we can begin to analyze the effects of allocation changes. We need to document the kind of services offered by outfitters as well as describe the financial characteristics of the industry.

#### Documenting Outfitter Services

To document the nature of commercial river trips, brochures were requested from each outfitter. Fifteen variables were then developed to describe trip characteristics such as length, price, cost per day, transportation and accommodations before and after the trip, types of boats, etc. These variables were listed across the top of Table 3, and the relevant information for each outfitter was then completed on the basis of the company brochure.

There is a considerable diversity of services. Trip prices range from \$37.50 to \$87.50 per day; some guides include transportation to and from the river, while others will arrange car shuttles at extra cost; water craft range from inflatable kayaks, dories, and small rafts to motorized 33 foot pontoons. One outfitter provides sleeping bags, mattresses, tents, and fishing gear, while others rent basic items like waterproof bags and camera boxes at extra cost; food ranges from "flapjacks and forty-mile stew" to "poulet ala moutarde and Indonesian Curried Lamb." Supplementary activities include massage and t'ai chi on some trips as well as the more standard hiking, swimming, and fishing; quality of advertising ranges from disorganized xerox fact sheets to well-designed 3-page color brochures. Readers interested in further details should consult Table 3.

TABLE 3

## OUTFITTER SERVICES IN HELLS CANYON

VARIABLE	LENGTH OF TRIP NUMBER OF TRIPS/ SEASON	TOTAL COST AND COST PER DAY (Does not include Sales Tax)  REQUIRED DEPOSIT	SPECIAL RATES	TRANSPORTATION TO AND FROM RIVER	ACCOMMODATIONS BEFORE AND AFTER TRIP
GUIDE					
OMER DRURY, M.D.	4 Days	\$150/\$32.50 per day	Groups of 17-29 can charter (must provide own food \$1,250/float). (Not specified length.)	Not provided in cost; will arrange special shuttles for cars or w/airplanes at extra expense.	None specified.
Troy, ID	1 Trip/Season	\$50 per person deposit			
GRAND CANYON DORIES	6 Days	\$460/\$60.00 per day	Youth Discount - 25% Fric Season - 5% (book before January 1)	Provided as part of trip cost; transportation from Lewiston/ Clarkston and return.	Provide one night's lodging at Skyway Motel in Lewiston.
Stanford, CA	15 Trips/Season	\$40 per person deposit			
LUKE JERSTAD ADVENTURES	5 Days-14/Season 6 Days-14/Season	5 day = \$365/\$69 per day 6 day = \$400/\$66.67 per day	Family Rates - 10% for 3+ persons.	Not included as part of price but will arrange car shuttles at extra cost.	None offered.
Portland, OR	28 Trips/Season	\$50 per person deposit			
SEVY BROTHERS GUIDE SERVICE	4 Days 6 Days	4 day = \$350/\$87.50 per day 6 day = \$415/\$69.17 per day	Children under 12: 25% discount.	Sevy Provides transportation from Cam- bridge Idaho to HCD, but must arrange own pick-up at end of trip @\$15 - 20.	None offered.
San Valley, ID	12 Trips/Season	\$100 per person deposit			
WILDERNESS ENCOUNTERS, INC.	3 Days-13/Season 6 Days-9/Season	3 day = \$245/\$81.67 per day 6 day = \$365/\$60.83 per day	Family Rates: first two pay full fare; third pays 85% additional pay 75% (for thoses 14 yrs and younger)	3 day price includes transpor- tation to and from Boise. 6 day price includes transpor- tation from Boise to Lewiston.	None specified.
Boise, ID	26 Trips/Season	\$152 per person deposit	"are available depending on group size, river, and antici- pated water levels."	3 and 6 day trips: transpor- tation to and from Boise; 6 day: transportation from Boise and return to Lewiston.	None specified.
HUGHES RIVER EXPEDITIONS, INC.	3 Days - } 4 Days - } 21/Season 6 Days - }	3 day = \$245/\$81.67 per day 4 day = \$310/\$77.50 per day 5 day = \$420/\$70.00 per day			
Cambodge, ID	21 Trips/Season	\$150 per person deposit			
HELL'S CANYON NAVIGATION CO.	5 Days	\$295 w/o fly back \$340 w/fly back \$59 to 68 per day	"Group or family rates avail- able on request." Family rates allow children to go for 1/2 fare.	Price w/o fly back only includes transportation from Oxbow to put- in at HCD; car shuttle to Lewis- ton @\$75/car.	Must provide own lodging. "Get ac- quainted meeting" at Oxbow includes one free drink.
Oxbow, OR	15 Trips/Season	20% deposit			
JAMES HENRY RIVER JOURNEYS	6 Days	\$365/\$60.83 per day	Children 12 to 17: 15% discount; under 12: 20% discount	Transportation to and from Lewiston provided.	
Berkeley, CA	6 Trips/Season	\$100 per person deposit			None specified.
ECHO RIVER TRIPS	6-day trips	\$370 adults-\$61.67/day \$295 youth-\$49.17/day	"youth fare" for those 17 and younger. Discount rates for groups of 10 or more.	Transportation from Boise to river and return to Boise included in fare.	None specified
Oakland, CA	6 trips/season	\$90 deposit			



TABLE 3 (Pg. 2)

VARIABLE	TYPE OF CRAFT	EQUIPMENT INCLUDED IN TRIP PRICE	EQUIPMENT AVAILABLE AT EXTRA COST	ADVERTISED PUT-IN/TAKE- OUT	ADVERTISED MEALS
GUIDE	NUMBER OF INDIVIDUALS PER TRIP OR CRAFT			DISTANCE TRAVELED	
OMER DRURY, M.D.					
Troy, ID	Not specified. "Sweep- powered" rafts shown in brochure. Maximum group size 30 including guide.	Waterproof bags available on "loan"; some air mattresses and sleeping bags on request.	Eating utensils and drinking cup must be brought along.	Advertised as a 95 mile trip, but it goes from Hell's Canyon Dam Launch site to Grande Ronde.	Not specified. Liter- ature implies that guests must help with food preparation (all vegetarian).
GRAND CANYON DORIES					
Stanford, CA	Grand Canyon Dories pat- terned after McKenzie River boat; 4 passenger/ boat maximum.	Waterproof duffle bags	Sleeping bags, case for camera/binoculars, eating and drinking utensils @ \$2.50/day.	Hell's Canyon Dam to mouth of Grande Ronde: about 85 miles.	All meals during trip are provided, menu not specified.
LUTE JERSTAD ADVENTURES					
Portland, OR	Hypalon 12-17 foot infla- table rafts; Trips "usually have less than 20 persons"; oar-powered.	Waterproof bags, boxes for belongings and tents in case of bad weather.	None specified. Must bring your own sleeping bag and clothing.	Hell's Canyon Dam to mouth of Grande Ronde about 80 miles.	"Lavish" meals of fresh meat, vegetables, fruit, steak, salmon, fresh salads and straw- berry shortcake and wine.
SEVY BROTHERS GUIDE SERVICE					
Sun Valley, ID	"Medium-sized rubber rafts"; oar-powered.	Waterproof bags and water tight metal con- tainers, cooking supplies, tents, cups.	Sleeping bags @ \$12/ trip; fishing gear at \$15/trip.	6 day trip: Hell's Canyon Dam to Grande Ronde about 85 miles. 4 day trip: HCD to Pitts- burgh landing about 32. 3 day trip: Hell's Canyon Dam to Pittsburgh Landing about 40 mi. 6 day trip: Hell's Canyon Dam to Grande Ronde.	"Dutch-oven" cookery of gourmet meals. Logger- size breakfasts, thick steaks, chicken, ham, fresh vegetables, wine.
WILDERNESS ENCOUNTERS, INC.					
Boise, ID	Not specified.	Waterproof duffle bags.	Sleeping bag, pad and ground cloth at \$25/ trip.		Type of meals not specified. Adver- tised as "good" food.
HUGHES RIVER EXPEDITIONS, INC.	Maximum load 4 guests and 1 crew person per boat; paddle/oar- powered; "Salmon River, Green River & Yampa River boats HIGH WATER: motorized 22' and 33' pontoon rafts; LOW WATER: "smaller oar-powered rafts; groups of 10-12 and 1 guide." Yampa and Avon paddle boats; Harasu III's and Green Rivers for gear boats; Hetzler slalom kayaks available.	Available list when trip is booked.	None listed.	3 day trip: } 4 day trip: } Hell's Canyon Dam to Pitts- burgh landing (about 32 mi)	Fresh meats, vegetables, fruits, flapjacks, ham and eggs, steak, pork chops, chicken, biscuits, desserts, "forty-mile stew". "Full breakfasts, light lunch, fantastic suppers; sizzling steaks, baked potatoes, canyon stew, dumplings and cobbler.
Osbow, OR		inflatable kayaks, large poles for fishing.	Sleeping bags @ \$5.00/trip.	Hell's Canyon Dam to con- fluence of Grande Ronde River about 85 miles.	Elaborate: ginger beef, poulet ala moutarde, Indonesian curried lamb, coq au vin, shish kebab, trout meuniere are common.
JAMES HENRY RIVER JOURNEYS		Waterproof bags for gear; water-tight ammunition boxes for cameras.	None listed.	Hell's Canyon Dam to Grande Ronde about 85 miles.	"Fresh food" of family style meals, fresh fruit salad, steak or stroganoff, dutch oven cakes."
Berkeley, CA					
ECHO RIVER TRIPS	4-6 persons per raft; rafts have 10' oars; offer in- flatable kayaks "on some rivers"	waterproof bags and gear boxes; may include sup- plemental kayak.	None listed	Hells Canyon Dam to Grande Ronde - 85 miles	
Oakland, CA					

VARIABLE	ADVERTISED ACTIVITIES (In addition to rafting or kayaking)	TYPE AND QUALITY OF ADVERTISEMENT  OTHER RIVERS RUN BY OUTFITTER	DATE 1978 BROCHURE WAS RECEIVED	SPECIAL FEATURES	CANCELLATION PROCEDURES
GUIDE					
OMER DORRY, M.D.				*Auxiliary motor used on Snake appears to be a small organiza- tion which is primarily con- cerned with Christain fellow- ship (Adventist).	\$50 deposit returnable for illness. 1/2 dep. ref. w/ 21 day notice prior to launch. Other 1/2 applied to future river trips.
Troy, ID	Hiking, swimming, Christain fellowship, photography.	Very poorly written and confusing (not well or- ganized). Literature appears xerox from copy. Also run Salmon.	2 Dec 77		\$40 non-refund. dep., bal. due 30 days prior to launch refund on dep. if before 20 days prior, no refund except if place filled.
GRAND CANYON DORIES	Swimming, natural his- tory, botanizing, geologizing, birding, historical scenery.	Very well done B&W bro- chure (24 pps.) describ- ing trip on Colorado, Salmon, Green, Owyhee and Grande Ronde Rivers. Well done. B&W brochure 22 pps. describing trips throughout the west; also advertised in Mt. Travel brochure.	1 Dec 77	Offer special kayak trips at 1/2 price (will provide food and take gear) if you bring your own kayak. Custom trips for groups of 15; can also schedule com- bination horse/float trip (16 day float trip) "details upon request".	\$50 dep.; cancel up to 30 days prior to launch for- feit; 30 days-1 wk, \$100, 1 wk or less all fee. Bal. due 30 days prior to launch
LIFE JERNSTAD ADVENTURES	Flora and fauna watching, history and geology, exploration.	Well done B&W and color brochure. 8 pps. 2 page schedule, also run Salmon, Owyhee, Deschutes, and New Zealand Rivers. Fairly well done (but general) color brochure, xeroxed fact sheets of standard quality. Run Main and Middle Fork Salmon.	14 Dec 77	McKenzie River boats available at twice normal rate; charter trips for 81 persons.	\$100 dep.; bal due bef. dep. up ref. up to 60 days prior trip, or credit on future trip.
SEVY BROTHERS GUIDE SERVICE	Photography, hunting, natural history, rela- xation, fishing, local history, hiking, swimming.		16 Dec 77		\$150 dep, bal due 60 days prior trip \$25 service chg. if can. bef. 60 days after 60 days ref. if res. filled.
Sun Valley, ID	Local lore, wildlife spotting, nature identification.			Run "Shepp Ranch" on Salmon River in addition to float trips. Float trips seem to be an "extra" to business. Offer a 3-day backpack/3-day Hell's Canyon combination (24 river miles) for \$420/ person. Charter service upon request.	\$150 dep. guarantees res.; if can. prior to 45 days, \$125 ref.; after 45 days dep forfeited or to another trip.
WILDERNESS ENCOUNTERS, INC.		Well done color and B&W brochures on high quality paper. Also run Owyhee and Salmon Rivers.	2 Jan 78	June 14 trip includes a "wilderness workshop" as part of the price. (Can get one college credit through Eastern Oregon State College.)	20% deposit, balance due 2 weeks prior to departure.
Balse, ID	Natural history, history, fishing, hiking, relax- ing, bird watching.	Poorly designed color bro- chure; low-key "River- Devil Review" newspaper. Run Hell's Canyon only. Very well designed B&W brochure on buff paper; run most major western rivers; also Alaska, Baja Kayak trips.	1 Feb 78	Can take your own kayak for 1/2 price; seem oriented to younger, mellow "zen" trips and encounter groups; lower Salmon run includes 21 miles on Snake.	\$100 dep. bal due 30 days prior launch, dep less \$20 fee ref. if res can be replaced.
HUGHES RIVER EXPEDITIONS, INC.	Fishing, hiking, swimming, history, wild- life, relaxing. Bellisic blend: massage, dancing music, aikido & tai chi, swimming, fishing, natural & cultural history.	Average black & white brochure and mimeo history of Hell's Canyon. Run rivers in Cal, Ore, Id, Alaska.	4 Feb 78	Orientation seems to be toward wilderness values.	\$90.00 deposit, balance due 60 days prior to departure; refund (less \$20.00 charge) up to 60 days before launch; refund less \$20 after 60 days if reservation filled.
HELL'S CANYON NAVIGATION CO.					
Cambridge, ID					
Osbow, OR					
JAMES HERRY RIVER JOURNEYS					
Berkeley, CA			15 May 78		
ECHO RIVER TRIPS			1 Feb 78		
Oakland, CA					

TABLE 3 (Pg. 4)

VARIABLE  GUIDE	LENGTH OF TRIP NUMBER OF TRIPS / SEASON	TOTAL COST AND COST PER DAY (Does not include Sales Tax)  REQUIRED DEPOSIT	SPECIAL RATES	TRANSPORTATION TO AND FROM RIVER	ACCOMMODATIONS BEFORE AND AFTER TRIP
WALKER RIVER EXPEDITIONS  Enterprise, OR	2 day trip-6/season 4 day trip-7/season 5 day trip-6/season 13 Launches/season	2 day-\$155-\$77.50/day 4 day=\$235-\$58.75/day 5 day=\$295-\$59.00/day \$50.00 dep.	5 day discounts - 5 or more people, \$265 each; children under 17 w/ parents, \$250 each.	Transportation to and from Enterprise included in fare.	None offered
WILDERNESS RIVER OUTFITTERS  Salmon, ID	4 day raft:7/season 3 day raft w/ back- pack (1 trip/season) 7 different trips/s.	4 day \$325=\$81.25/day 3 day + 4 day backpack \$425 25% deposit	No special rates listed	Transportation to and from Boise included in fare.	None offered
IDAHO ADVENTURES  Salmon, ID	6 day trips  19 trips/season	\$435=\$72.50/day  \$100/person deposit	15% per person discount to students under 19 when accompanied by 2 full fares; 10% discount to groups greater than 10 people. Group discount: 5 guests = 5% 10 or more = 10%; 100% reduction for children aged 12-15.	Transportation to and from either Boise or Lewiston as part of price.	None offered
ROCKY MOUNTAIN RIVER TOURS  Pocatello, ID	3 day 9/season 6 day  9 trips/season	3 day \$225=\$75/day 6 day \$420=\$70/day  \$100 per person dep.		Round trip transportation provided.	None offered
PRIMITIVE AREA FLOAT TRIPS  Salmon, ID	5 day (private) 22/s. 6 day (group) 13/s. will run 4 day on request. total 35/season	5 day Private \$325 (4 person minimum) \$65 per day \$50 deposit/person	25% children's discount - 10% to students and first repeats; 25% to 2nd time repeats; groups rates available upon request min. group 20 persons.	Price includes transportation from Boise to Hells Canyon Dam & from Grande Ronde to Lewiston; car shuttle to Lewiston @ \$85.	Pick-up at Holiday Inn at Boise, but does not include accommodations in price.
SNAKE RIVER OUTFITTERS  Lewiston, ID	3 day } 13 trips 5 day } per season  13 trips/season	3 day:\$215=\$71.67/day 5 day:\$295=\$59.00/day  25% discount	no group rate specified	Doesn't specify where passengers are picked up; all are returned to Lewiston by jet boat.	None specified
HELLER BAR EXCURSIONS  Asotin, WA	3 day } 17 trips 5 day } per season  17 trips/season	3 day:\$200=\$66.67/day 5 day:\$300=\$60.00/day  25% deposit	"family rates available" but not specified	Heller Bar to Heller Bar	None specified
WHITEWATER GUIDE TRIPS  Portland, OR	6 day 6 trips/season	\$390/person-\$65/day  \$150 deposit	12 or more persons 10% discount; children under 15 - 15% discount.	Transportation provided from Lewiston and return.	None specified (break- fast first day and dinner last day not provided)

TABLE 3 (Pg. 2)

VARIABLE  GUIDE	TYPE OF CRAFT  NUMBER OF INDIVIDUALS PER TRIP OR CRAFT	EQUIPMENT INCLUDED IN TRIP PRICE	EQUIPMENT AVAILABLE AT EXTRA COST	ADVERTISED PUT-IN/TAKE- OUT  DISTANCE TRAVELED	ADVERTISED MEALS
WALKER RIVER EXPEDITIONS					
Enterprise, OR	oar and motor powered 17' and 20' long rafts	none provided	Camera box @ \$1.00 waterproof bag @ \$4.00 Sleeping bag, air matt. & waterproof bag @ 18.00	2 day - Hells Canyon Dam down- stream 25 miles (Pittsburg?) 4 & 5 day - HCD to Grande Ronde. Put in at Hell's Canyon Dam (except backpack option); Take out Pittsburg Landing = 32 miles.	"Steak, spaghetti, chicken, tossed salads, pancakes"; "Wholesome, delicious, home-cooked"
WILDERNESS RIVER OUTFITTERS					
Salmon, ID	oar powered rafts	waterproof pack for gear and camera and cooking and eating utensils	Sleeping bag, air mattress & tent @ \$30 Fishing tackle @ \$15		Not specified
IDAHO ADVENTURES					
Salmon, ID	oar powered rafts with a maximum of 6 persons/raft average 4 persons/raft	tents, eating utensils	sleeping bags @ \$20 camera boxes @ \$1.00	Hells Canyon Dam to Grande Ronde River = 85 miles.	"Delicious fresh food served in a fine Western manner" "Thick steaks"
ROCKY MOUNTAIN RIVER TOURS					
Pocatello, ID		waterproof bags & water- proof camera cases.		3 day - Hells canyon Dam to Pittsburg Landing 6 day - Hells Canyon Dam to Heller Bar.	Dutch oven cookery, "var- iety of fresh meats, salads & vegetables...dutch oven beer bread..."
PRIMITIVE AREA FLOAT TRIPS					
Salmon, ID	Not specified Inflatable rubber rafts	Sleeping bags, nylon tent, mattresses, hunting & fishing gear, kayaks, & paddle rafts free on req.	None listed. LODGE OPTION: (showers, "gourmet meals", cabin @ \$30/person. McKenzie boats avail. 2x price.	Hells Canyon Dam to confluence of Grande Ronde River = 85 miles	"Thick steaks, broiled trout, ice, prime rib, fresh vegetables are standard fare"
SNAKE RIVER OUTFITTERS					
Lewiston, ID	None specified (show large pontoon craft in color brochure)	None specified (We furnish everything but personal items.)	None specified	3 day - Hells Canyon Dam downstream 45-50 miles return by jetboat; 5 day to mouth of Grande Ronde = 85 miles.	"Home cooking" provide ice and coolers for drinks.
HELLER BAR EXCURSIONS					
Asotin, WA	none specified	nothing except meals, raft, lifejacket	none specified	Hells Canyon Dam to Heller Bar	Type of meals not specified.
WHITEWATER GUIDE TRIPS					
Portland, OR	Type of craft unspecified; 4-5 persons per craft carry inflatable kayaks	waterproof duffle bag	None specified	Hells Canyon Dam to mouth of Grande Ronde = 85 miles	"Good cooks"

TABLE 3 (Pg. 6)

VARIABLE GUIDE	ADVERTISED ACTIVITIES (In addition to rafting or kayaking)	TYPE AND QUALITY OF ADVERTISEMENT  OTHER RIVERS RUN BY OUTFITTER	DATE 1978 BROCHURE WAS RECEIVED	SPECIAL FEATURES	CANCELLATION PROCEDURES
WALKER RIVER EXPEDITIONS  Enterprise, OR	Swim, sunbathe, fish, hike, explore, history and wildlife.	Fair black & white brochure and reservation form. Also run Salmon River.	7 Feb 78		Bal. due 21 ds. prior dept. deposit refund up to 45 ds prior to dept. & if cancel- led res. can be filled.
WILDERNESS RIVER OUTFITTERS  Salmon, ID	Excitement & relaxation, hiking, swimming, fishing, hunting.	Fairly well done color brochure but lacks in infor- mation. Also run Bruneau, Owyhee, Salmon	14 Feb 78	Back packing trip combination is in Seven Devils Wilderness Area, Oregon.	25% deposit; balance due 45 days prior to launch; deposit refund up to 45 days prior to launch.
IDAHO ADVENTURES  Salmon, ID	Wildlife, hiking, fishing, hunting, history.	Well done but general color brochure; well-worded letter on each river. Also run Salmon and Owyhee.	16 Feb 78	Fall trips feature chuckar hunting and fishing.	\$100 dep - bal due 20 days prior to launch. Dep. refund (less \$10 fee) up to 30 days prior to trip.
ROCKY MOUNTAIN RIVER TOURS  Pocatello, ID	Swimming, sight-seeing, wildlife appreciation.	Average b & w brochure w/ mimeo fact sheet not too professional; also run Salmon River	1 April 78	Can arrange car shuttle for \$75 reduction on 6 day trip, \$55 reduction on 3 day trip.	\$100 dep-bal due 30 days prior to trip; ref (minus \$25 fee) up to 30 days prior to launch.
PRIMITIVE AREA FLOAT TRIPS  Salmon, ID	Hunting, fishing, photo- graphing, archeology, scen- ery, Indian habitat, swimming.	Full color brochure w/4 page cover letter; reasonably well presented. Run Selway, Owyhee & Salmon.	29 Oct 77	Chuckar hunt available after 1 August.	Res. taken up to 1 week prior dept; \$50 dep will apply to future trips if cancelled.
SNAKE RIVER OUTFITTERS  Lewiston, ID	Swimming, fishing, photography.	General color brochure not very good; other brochures o.k. but not specific on details. Run only Snake.	25 March 78	Run lodge w/showers at Kirby Creek south of Pittsburg Landing.	25% deposit; cancell- ation policy not listed.
HELLER BAR EXCURSIONS  Asotin, WA	Swimming, wilderness	General color brochure not too well designed; card describing river trips very brief. Also run Salmon.	1 April 78	Combination jet boat and float trips.	25% deposit; made 30 days prior to launch; balance due at least 7 days prior to launch; deposit non- ref. on cancellation.
WHITEWATER GUIDE TRIPS  Portland, OR	Fishing, hiking, swimming, sunbathing, photography, drawing, rock hounding.	Very well done brochure w/1 color photo; newspaper. Run Salmon, Grande Ronde, Desch- utes, Owyhee, Rogue.	2 May 78	Seem to run family-type trips; excellent advertising, can charge on Mastercharge or Visa	\$150 deposit Refundable up to 30 days prior to departure.

It is difficult to comprehend the range of river experiences offered by outfitters without this kind of systematic analysis. Similar information collected in the future will help document changes associated with different allocation procedures. Managing agencies may want to organize the information at more frequent intervals for other purposes.

#### Financial Information on the Outfitting Industry

Regulating an industry requires specific financial data in addition to the more general descriptive information presented above. Because this is a fairly specialized topic, it is treated in Appendix 4, written by C. R. Michael Parent. Dr. Parent is an economist in the School of Business at Utah State University, and he prepared for the National Park Service an economic analysis of outfitters operating on the Colorado River in Grand Canyon. His report for the present project describes the position of outfitters under current agency regulation and discusses regulatory systems and financial reporting procedures.

#### Certification versus Allocation

Certification requires guiding services to meet minimum standards for health, safety, and quality of services. Allocation gives outfitters control of a certain amount of space on the river, for which they become "brokers." Licensing by managing agencies has usually involved both procedures, but certification probably does not require allocation. The problems associated with allocating large blocks of use to outfitters may be a reason to separate the two. Other goals (such as limiting the number or size of outfitting businesses) could be accomplished by other means (such as establishing an upper limit on the amount of use by any one outfitter).

## V. DEVELOPING NEW ALLOCATION SYSTEMS

This report has covered a great deal of material. From a manager's point of view, the question now is "What do I do with all this?" Our answer is in two parts. The first, presented in this section, is a general framework for thinking through an allocation decision on any river. The second, presented in a following section, is a more specific discussion of the situation in Hells Canyon.

There are many "formulas" for making decisions; none makes a tough decision easy, but there are some common characteristics. Most decision processes recognize the need to: define the problem, decide what you want to accomplish, generate alternative methods for reaching goals or objectives, choose an alternative, and implement and evaluate the chosen program. All are an attempt to move from general, often nebulous goals to specific management and allocation decisions in a clear, reasonable, and traceable manner. A specified decision process ties the decision to management goals, insures that crucial steps are not forgotten, gives documentation of the decision process, and provides a basis for more reasonable discussion of the issues by supporters and dissenters alike. The idea here is to outline such a structure for making allocation decisions.

### IS THERE A PROBLEM?

Allocation only becomes an issue when the number of people wanting to run a river exceeds carrying capacity. If your river doesn't have an established use limit, or if use pressures don't exceed the limit at least some of the time, then you do not yet have an allocation problem. This does not preclude permits as a way of documenting use; it just means that rationing is not yet necessary.

Not having a problem now doesn't mean you won't have one in the future.

The past 10 years have seen rapid increases in the use of whitewater rivers, sometimes as great as 50 - 60% per year. If a use limit hasn't been set, start thinking about the kind of river experience you're trying to provide and the appropriate number of people for that experience. If use might approach capacity in the foreseeable future, think about allocation. It is always easier to set capacities or make allocation decisions before acceptable limits have been reached; everyone can still "win," and it is possible to try different ideas without intense political pressure. Developing a comprehensive scheme at the start will also make it unnecessary to back track later from an unsatisfactory piecemeal solution. Keep in mind that "indirect" allocation mechanisms which redistribute use are usually temporary solutions.

#### WHAT SHOULD THE SYSTEM ACCOMPLISH?

Deciding what you want an allocation system to do is a difficult but crucial task. It is hard enough to make unilateral decisions about such things, but the job becomes increasingly difficult with the need to consider legal guidelines, agency mandates, court rulings, and the concerns of different interest groups.

We have found it useful to distinguish between goals and objectives. Goals provide a starting point and general direction, but they are by nature somewhat vague and nebulous. Objectives help to define and clarify goals; they should be specific enough so that you can tell when you are getting closer or further away. For example, "fairness" is a likely goal for allocation, but it needs clarification. One objective might be "giving everyone an equal chance for a permit;" another might be "giving preference



to people who haven't been able to get permits in the past." Obviously the general goal can be defined with specific objectives which have quite different implications.

Equity, equality, efficiency, and recognizing need are frequently mentioned goals for allocation. The concerns of outfitters, private users, and managers discussed earlier are other examples of goals or objectives (depending on their specificity) for river use allocation. Start out by listing all the goals which seem appropriate for your particular situation. Each goal should then be defined with more specific objectives. As you proceed, you may discover conflicts or inconsistencies among goals. Some examples of goals and objectives are given in Table 4; these ideas are meant to be suggestive rather than exhaustive.

#### ARE THERE ANY CONSTRAINTS?

Constraints usually make themselves known, but listing them helps to avoid their appearance at inopportune times and sometimes suggests ways to avoid them. Common constraints are time, budget limitations, manpower, legal or administrative guidelines, political considerations, and the way things have been done in the past. While constraints deserve recognition and healthy respect, you probably want to avoid assuming that there is no room for planning or change. A well thought out innovation may overcome constraints which appeared intractable.

#### GENERATING AND EVALUATING ALTERNATIVES

There are lots of ways to do things. The idea is to consider different alternatives for accomplishing your objectives. It may be easier at the

TABLE 4

## EXAMPLES OF GOALS AND OBJECTIVES FOR ALLOCATION

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GOAL: Equality. Everyone gets an equal share of the resource or has an equal likelihood of getting to use it.

POSSIBLE OBJECTIVES: Give equal shares or equal opportunities.

- 1) See that no one gets to use the resource more often than anyone else.
- 2) Give everyone an equal probability of getting a permit, regardless of past success, need, value placed on running the river, willingness to pay, type of trip desired (private or commercial), etc.
- 3) Charge all users the same fees.
- 4) Require everyone to use the same procedure for getting a permit.
- 5) Reduce conflict by minimizing group differences.

GOAL: Social Efficiency. Produce maximum benefits by seeing that the resource is used by those for whom it has the greatest value.

POSSIBLE OBJECTIVES: Require users to assess the value of running the river relative to the value of other desirable activities by giving the permit a "cost" in terms of:

- 1) Money for permit fees.
- 2) Time and effort required to carry out application procedures.
- 3) Planning in advance of the point when use will occur.
- 4) Skills or equipment required to run the river.

These costs might be: a) equal for all users, but higher for users than non-users, or b) different for different users, giving those willing to "pay" more a greater likelihood of getting a permit.

TABLE 4 (continued)

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GOAL: Equity. Those who put more into the system (money, time, effort, etc.) get more out of the system (greater likelihood of running the river).

POSSIBLE OBJECTIVES: Give a better chance of obtaining a permit to groups such as:

- 1) Taxpayers or residents.
- 2) Those who have been unsuccessful at getting a permit in the past.
- 3) Those who are willing to pay higher permit fees.
- 4) Those who are willing to spend more time applying.
- 5) Those who have acquired river running skills or equipment.
- 6) Those who have run the river more in the past.
- 7) Those willing to donate time and effort (e.g., restoration or hauling trash).
- 8) Those who abide by regulations (e.g., those who show up to claim reservations, follow use practices, etc.).

GOAL: Recognize Need. Give more to those who need more.

POSSIBLE OBJECTIVES: Allow greater access to groups such as:

- 1) Those owning land along or near the river.
  - 2) Those who depend on the river for their livelihood (such as fishermen or outfitters).
  - 3) Public service organizations (such as boy scouts, remedial or correctional programs).
-

start to consider the options for each objective separately; you can then combine and integrate these "small" options into several comprehensive alternative plans. On the other hand, you may do better by starting with more comprehensive alternatives.

It usually helps to set up a matrix something like the one in Table 5. The boxes can be filled in with a simple "yes" or "no," brief comments, numerical rankings or values, etc. The objectives and constraints essentially become the criteria for evaluating the desirability of different alternatives. Allocation alternatives include the pricing, queuing, merit, reservation, and lottery mechanisms described in this report; retaining an existing system is a "no change" alternative. You may be able to come up with others depending on the situation. Keep in mind that most systems combine different mechanisms in order to meet allocation goals, and you may want to do the same.

#### MAKING A DECISION

This involves choosing and justifying a plan. Although making decisions isn't easy, this should be fairly straightforward if the previous steps have been carefully thought out and well integrated. You need to explain why the chosen alternative best satisfies constraints, accomplishes objectives, and moves towards goals; it is important that people understand the trade-offs among different alternatives. It is of course possible that the plan you have chosen cannot accomplish all the objectives, and that, too, will need explaining.

No mention has been made of public participation. The public can be consulted at every stage or at selected points; it is also possible to use less formal mechanisms (such as key contacts or advisory groups) at some

TABLE 5  
CRITERIA FOR EVALUATING ALTERNATIVES

	Alternative 1	Alternative 2	Alternative 3	Etc.
Objective 1				
Objective 2				
Objective 3				
Etc.				
Constraint 1				
Constraint 2				
Etc.				

stages and full public review at others (agency or federal guidelines may dictate this). In any case, public involvement usually means presenting what you've done, getting people's reactions, and then going back and revising your work in light of the new information.

## IMPLEMENTATION

Implementation is difficult to discuss at this time because it really depends on the approach which is adopted. The problem is to turn the chosen alternative into a workable plan. It helps to develop scenarios, starting with the user who wants a permit and ending with that user getting on the river. Major issues include handling requests for information, making the reservation (in person, by phone, by mail), handling applications (by hand or automation), issuing permits (by mail, at the launch site), necessary personnel and facilities (both office and field), costs, handling foul-ups, and the problems of converting from an old to a new system.

## FOLLOW UP AND ADJUSTMENT

The system needs to be monitored on a long term basis to see that it continues to meet allocation goals. The goals themselves may also change in time. Record keeping and data analysis are quite easy with a properly designed computerized system, but hand-kept records shouldn't be too much of a burden if the process is carefully thought out. We suggest collecting the following information each year, even if you decide to stick with your present system. Information about outfitting businesses, as discussed earlier, is also important. Uniform data collection allows a comparison of different allocation systems.

### Data Describing the New System

User data should be collected on a routine basis at three different times: when the user requests a permit, between initial contact and launch, and on launch day. Data need to be analyzed each year at the end of the season. Other information about user characteristics and management preferences, when necessary, is collected by sampling the user population; this requires a special research effort.

Initial Contact. Data collection begins when a user contacts the agency for a permit. The agency records the application date, how the application is made (mail, personal visit, telephone, etc.) and the expected trip description (who will go and length of trip). This forms the baseline from which later calculations are made. Information is organized most simply by assigning each permit request a unique identification number under which information gathered at later times can be added.

Between initial contact and launch. Requests are treated in one of three ways: a permit is issued as requested, a permit is issued with modifications (e.g., reschedule launch date), or the permit is denied. If a permit is issued, any modifications are noted. If the permit is denied, the reason for denial is recorded and data collection for that application ends. If there is a cancellation any time before launching, the cancellation is recorded and data collection ends.

Launch day. If a permittee fails to show up on launch day, this information is recorded and data collection ends. If the permittee arrives as scheduled, data describing the trip are collected. These include: the final trip roster, length of trip, type and number of craft, and type of trip (private or commercial). The entire data collection process is summarized in Table 6.

TABLE 6  
SUMMARY OF DATA COLLECTION PROCEDURE

### Initial Contact

- 1) Give each request unique ID number.
- 2) Record how the request is made (personal visit, telephone, mail, etc.)
- 3) Record date application was received.
- 4) Record requested launch date.
- 5) Record expected trip length.
- 6) Record expected trip roster (names).

### Between Contact and Launch

Is permit rejected?                      yes —————→ Record reason, stop recording

no



Is permit modified?                      yes —————→ Record modification

no



Record permit issue date ←—————

Did the group cancel before launch?      no —————→ Go to launch day

yes



Record cancellation date, stop recording

### Launch Day

Did the group show up?                      no —————→ Record as "no-show," stop recording

yes



- 1) Record date of launch.
- 2) Record type and number of craft (raft, kayak, drift boat, etc.).
- 3) Record length of trip.
- 4) Compare actual roster with original and record number of passengers requested, final number taken, and percentage of names changed.



Data analysis. Most agencies collect use data, but the information is often left in a raw form which isn't useful. Data analysis means deciding what aggregate figures are desired and then compiling the information from the raw data. Some of the more useful computations would include:

1. The number of applications received each day from private and commercial users, tallied on a calendar. This would show planning horizons.
2. The number of launches requested for each day aggregated by day of the week, month of the season, and total for the season. This would show use patterns, peak use periods, and yearly changes for different user groups.
3. Percentage of applications which are issued, rescheduled, and rejected, and the reasons for rescheduling or rejecting.
4. Percentage of cancellations and no-shows (by user group, method of making reservation, and length of lead-time).
5. Number of trips and people launching, aggregated by day of the week, by month, and by season. When compared with (2), this would show how actual use patterns compare with requests.
6. The average number of days in advance of launch that permits are requested, separated by user group. This will give information about lead times.
7. Percentage of names changed from initial to final roster, and average increase or decrease in group size.

System costs. The costs of the permit system should be separated from other management expenditures and divided into non-recurring development and recurring operating costs. Combining the two will give the

total cost of administering the system. Cost data will be useful in determining the cost-effectiveness of different alternatives. Cost data should include:

Development Costs

wages and salaries  
 planning  
 equipment and hardware  
 computer programming  
 uniforms  
 training  
 facility construction or  
 modification

Operating Costs

wages and salaries  
 expendable materials  
 management and supervision  
 utilities (e.g. telephone)  
 facility maintenance

#### AN ALLOCATION SYSTEM FOR HELLS CANYON

How does this information apply to Hells Canyon? This is a difficult question, to which we will provide only a partial answer. The aim in this project has been to identify and explore allocation issues, analyze the effects of current river allocation systems, and explore alternative systems and their possible effects. Putting this into practice is management's job. But because of our experience, we have a point of view which should be helpful in developing new systems. As a result, we have responded to the Forest Service's request for recommendations.

A draft of this report was submitted to the Forest Service. We later met with managers, who specified the following goals (1 and 2) and objectives (3 to 9). They felt that the allocation system in Hells Canyon should:

1. Be administratively feasible.
2. Be politically acceptable to outfitters, private users, and commercial users.

3. Recognize the needs
  - of outfitters to know launch dates before the season.
  - of commercial passengers to travel in groups and connect with an outfitter, a launch date, or both.
  - of private boaters to organize groups and connect their group with a launch date.
  - of all users to have reasonable (neither too short nor too long) planning horizons.
4. Specify equal permit procedures for private and commercial users while recognizing user needs.
5. Make efficient use of the resource by
  - minimizing no-shows.
  - making cancelled launches available to other users.
  - allowing for spontaneous use.
  - referring unsuccessful applicants to open dates.
  - discouraging groups from showing up without a permit, hoping for an unclaimed launch.
6. Provide flexibility by
  - allowing for changes in group composition.
  - allowing changes in launch dates.
  - responding to changes in demand over time.
  - specifying procedures which will be used when applications exceed capacity.
7. Minimize the incentives for creating "artificial" demand in either sector.
8. Provide information to users about selection procedures and the probabilities of success.

9. Simplify application procedures as much as possible.

Overall use of Hells Canyon in 1978 was well below capacity, so little rationing is needed at this time. A more flexible and efficient reservation system would solve most problems, although provision should be made for rationing in the future (if use continues to increase at 22% per year, total use will double in approximately 3 years). Given the goals and objectives specified by the Forest Service and our knowledge of allocation mechanisms and river management, we recommend the following system. This isn't the "last word" in allocation; it represents one among many combinations of alternatives, and there will probably be faults in the logic and unforeseen problems for implementers. Managers will have to decide on their preferred alternative, defend whatever they endorse, and work out the bugs which appear during implementation.

For the first year, the launch schedule will remain exactly as it is now (3 private and 2 commercial launches per day, with outfitters assigned their present launches). In subsequent seasons, daily launches would be assigned similarly, but the proportion allocated to each sector might change, based on the number of permit applications the previous season. It would also be possible to adjust the proportions of trips based on seasonal variation in demand (e.g., private boaters currently use more launches in September). To provide stability, no more than one launch per day would change sectors from one season to the next. Both outfitters and private groups could exchange launch dates among themselves, but no one outfitter could exceed the 13 - 14 launches allowed by his permit.

All users (commercial passengers and private boaters) would apply for permits as individuals. Time of application would be based on user planning horizons, which we will be able to determine from data collected

during the 1978 season. The application form would include the user's name and address, four launch dates in order of preference, and whether the person wanted a private or commercial trip. Social security numbers would be helpful but not necessary. Commercial passengers wanting to go with a particular outfitter would have contacted him to find out his launch dates, while passengers more concerned with a particular date would apply for a permit first and later contact whoever had a trip at that time. Persons who wanted to go in groups would submit their applications together in the same envelope (private parties would also designate a trip leader). Maximum number of applications in one envelope would be maximum trip size (private) or maximum trip size minus crew (commercial).

Completed applications received by the Forest Service would be sorted according to the first choice launch date. Commercial applications would then be selected until the number of successful individuals equaled the number of launches for the day times the number of passengers per trip (currently 2 launches times approximately 25 passengers = 50). If the final selection were a group which caused the total to exceed 50, that group would be rejected and a smaller one would be chosen (it would be possible to specify an acceptable range here, e.g., 45 - 52). Successful applicants would contact outfitters.

Private applications, already arranged into groups by users, would be selected until the number of groups equaled the number of private launches for the day. Private groups will probably be smaller than the maximum trip size, but this does not concern us because carrying capacity is based on the number of trips launching. As demand increases, group size will probably increase, but if not, it would be possible to specify a minimum size for private trips on high use days.

The procedure outlined in the preceding paragraphs would provide more equal treatment than current split systems, helping to eliminate the different allocation mechanisms now operating in each sector. However, procedures would still be somewhat different because some inequality better meets the needs of users and outfitters.

If applications for a given day exceeded the maximum allowed, selection of successful applicants for that day would be by order of post-  
marks or lottery. The former is used currently; it works well as long as the number of applications does not greatly exceed capacity. For days when applications are more than 1 1/2 times capacity, a random selection procedure would probably be more workable.

Applications rejected in the first round would be placed in a pool to give second choice launches. As in the first round, applications would be sorted by date and selected until all second choices were granted or days were full. Third and fourth choices would be handled similarly. Any launches left open would be available on a first come/first served basis.

All trips would have to be confirmed by mail or telephone, at least 30 but not more than 60 days in advance of the launch date (our data indicate that this fits with user planning horizons). Confirmation would be by the outfitter or private trip leader. All unconfirmed launches would be considered cancelled and would become available to either sector on a first come/first served basis. This would allow more complete utilization and provide opportunities for those with shorter planning horizons. If competition for cancelled launches became intense, a random selection process might be needed.

The need to transfer permits should be minimized if application procedures fit with user planning horizons, but some flexibility is desirable. It makes sense to allow the transfer of some portion (e.g., 25 - 33%) of the individual permits for any given launch. Changes in excess of this would require cancellation and re-issue of permits through the Forest Service. Occasional identification checks could be made while checking permits at the launch site. Trips with excessive transfers would not be allowed to launch.

Information given to users prior to application should describe application procedures and provide a basis for judging the likelihood of getting a permit for different days. Two simple bar graphs showing the number of private and commercial permits applied for each day during the previous season would probably suffice; the commercial graph should show individuals while the private shows trips. Such information would allow users to weigh their own preferences against the probability of success and would help distribute requests throughout the season.

The procedure outlined above would be somewhat cumbersome if done by hand but fairly simple for a computer program. The Pine Ranger District office will soon have a computer terminal, making the system convenient. Computerizing would also simplify mail-outs and record keeping. We suggest collecting data in the manner outlined earlier in this report.

Several issues need to be resolved before this system can be implemented. First, we need to know the planning horizons of private and commercial users. This information was collected last summer, and it will be available in the next few months.

Second, the Forest Service needs to reconsider the 30 person trip size maximum. Average sizes for both private and commercial trips are much smaller, suggesting that the limit is too high. The proposed system will, over time, push commercial trips to maximum size.

Finally, how will launches be re-allocated among outfitters if demand changes? We suggest that the number of outfitters be increased or decreased rather than changing the number of launches for each outfitter. Allowing increased launches might provide incentive to generate demand through advertising as well as promote larger size and lack of diversity among outfitting businesses.

## VI. CONCLUSION

Allocation problems are seldom easy, and the distribution of river use is no exception. It would be a major accomplishment to begin to move toward systems which are designed to accomplish specific allocation goals. Initially this will be done on a case by case basis, but there is a need for a more integrated approach. In a study of the Snake River in the Grand Tetons, Parent and Robeson (1977) found that Park Service policies regarding the river section in Grand Teton National Park affected congestion and crowding on the adjoining Forest Service section. These two areas are in closer proximity than most other management units, but it is likely that policies for one river will affect the use of others. As problems on individual rivers are solved, managers will have to broaden their views. Research also requires a more comprehensive point of view. We needed to understand factors such as interrelationships in use patterns, displacement of users from one area to another, and the substitutability of one river experience for another.



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